DECEMBER 8, 1958

STEEL
The Metalworking Weekly

A PENTON PUBLICATION

Boeing's Otto Plagens Squelches Tales About Excessive Maintenance Cost of Numerical Control

• Plant engineer at the firm's Wichita, Kans., facility, Mr. Plagens told STEEL: You can't afford to pass up the benefits of numerical control, and you can afford to maintain it. You will need to develop special techniques, as with any new machine . . . *Page* 108

METALWORKING OUTLOOK . . . *Page* 55

Metalworkers Predict Defense Business Will Climb in 1959

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Upturn Due Next Year in Britain

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Detroit Tool Shops Fight for Lives

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Six-Point Cost Cutting Proposal Shatters Inspection Bottleneck

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Gray Iron Shipments on the Rise

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B&W's Mr. Tubes

helps you engineer for profit

When a product involves the use of steel tubing, B&W's Mr. Tubes can help you *engineer for profit*—help you reduce costs and make a better product. Take for instance an application involving the use of alloy mechanical tubing.

From the standpoint of economics, there can be only one tubular product which is best suited for your particular fabrication procedures and optimum end use service. The choice of that tube involves the questions of the grade of steel itself, its heat treatment and mechanical properties, whether it should be electric furnace steel or the open hearth grade, whether it should be a hot finished or a cold finished tube. Other factors include surface finish, tolerances and the economical quantity and type of length.

These are but a few of the many considerations involved in buying the right tube for a job. Next time you are planning a product in which tubing is used—call in Mr. Tubes, your B&W district sales representative—and make him a member of your product planning team. He can help you as he has helped others. Write for Bulletin TB-361. The Babcock & Wilcox Company, Tubular Products Division, Beaver Falls, Pa.

B&W

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OF POSSESSION FOR STEEL

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CAN HELP YOU REDUCE!

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Bethlehem Pacific Coast Steel Corporation,
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Whether you're planning a new product or want to improve on the forming of a part in an established product, perhaps COMMERCIAL'S "Task-Forging" service—backed by over 30 years of metal forming experience and specialized equipment which includes 1½" thru 8" upsetters—may be able to help you. Address: Commercial Shearing & Stamping Company, Dept. L-50, Youngstown 1, Ohio.

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SPECIALISTS IN THE SHAPE OF THINGS TO COME

Here's how to

KEEP COSTS DOWN on Welding Operations

The NEW Low Cost "Budget 500" AC transformer arc welder

Here's HOBART'S answer–

You can solve the high cost production problem and realize greater profit with the new "Budget 500." It will cut costs for you, 3 ways: 1. It's priced low. 2. It will keep maintenance costs to an absolute minimum (rugged, long-lasting construction includes the qualities that have made Hobart the standard of comparison). 3. Its performance will add to every operator's efficiency, helping him turn out better work with less effort.

How Well does it Perform? Special steel cores and a "shell type" design keep efficiency extremely high. No load losses are kept to a minimum. The "Budget 500" is rated at 500 amperes, 40 volts. Welding current range: 100 to 625 amperes. A high open circuit voltage provides easy arc striking and a continuing smooth, stable arc.

What about Control? Hobart's "Diverter Path" magnetic field-rheostat method of control enables the operator to adjust welding current safely and accurately throughout the machine's long life. It is extremely quiet. Cores and coils are firmly anchored—they cannot become noisy or cause difficulty in controlling current.

Does it have Cool Operation? Definitely! A powerful, shrouded down-draft fan draws clean, fresh air from the cabinet's top sides—not from the bottom where dust, lint and dirt are likely to collect. *All* internal parts are bathed with cool air.

Why was the "Budget 500" Made? Because Hobart is constantly alerted to welding industry problems. Keeping overhead costs down is one of them. You're bound to benefit by checking into the advantages of this welder. Send for complete details now while the thought is still fresh in your mind.

A COMPLETE LINE OF TRANSFORMER TYPE ARC WELDERS FOR EVERY REQUIREMENT

THE "HUSTLER," 180 amp. small shop welder. Easy to operate. It cuts, burns holes, hardsurfaces, solders, brazes, heats metal for bending and forming. Comes complete with accessories–ready to weld.

INDUSTRIAL AC TRANSFORMER, 300, 400, 500 amp. models feature Multi-Range Dual and Remote Control. Compact cabinet with protected recessed controls. Can be mounted overhead where floor space is a premium if desired. Fixed cores and coils keep operation permanently quiet.

AC/DC TRANSFORMER RECTIFIER WELDER, 200, 300 amp. models. Versatility, speed, great welding range—all in one package. A flip of the selector switch converts operation for either AC or DC operations (straight or reverse polarity). Does every job easier, faster. Lets you take advantage of the latest electrodes for both AC and DC welding. This one low cost unit also includes Multi-Range, Dual Control.

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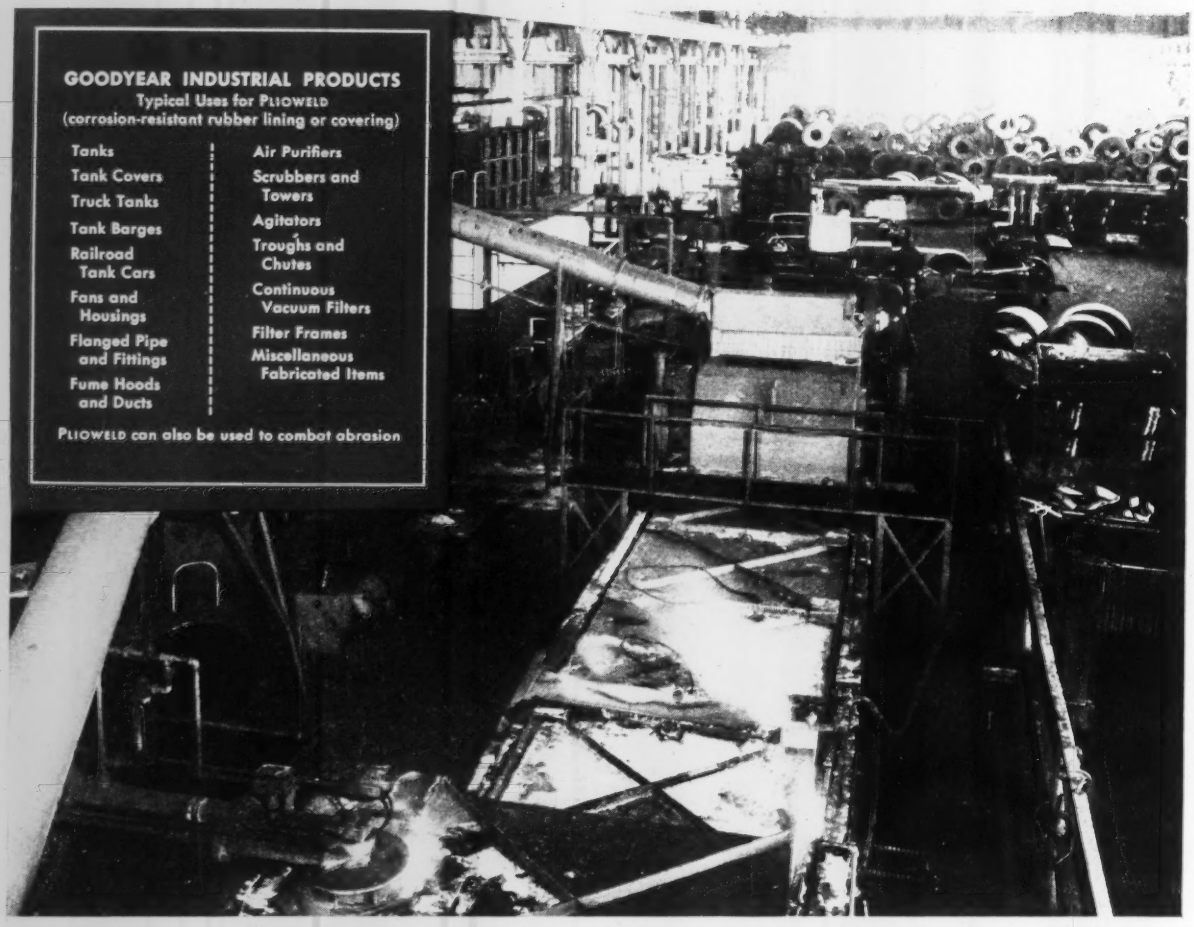

These rubber-lined tanks pickle with an underwater flame

A UNIQUE new way to heat pickling tanks—with an open flame actually submerged in the pickling solution itself—promised important new economies at this Midwestern steel plant. But they were solidly sold on rubber-lined tank advantages. And in such tanks, the new system had been tried at other plants—and had failed.

Then they called in the G.T.M.—Goodyear Technical Man—and gave him the problem. After careful study, he and his colleagues designed and engineered tanks that make the most moneysaving use of underwater firing. Key to their success was the use of PLIOWELD Tank Linings—especially compounded to stand up under the concentrated acids and high temperatures.

In just over a year, *these tanks processed 1,000,000 tons of steel—are still in perfect condition—have brought the company important savings.* And that's just one more example of the way the G.T.M. provides effective answers to vital production problems—with extra-quality products. To cash in on this unique ability, contact him by writing: Goodyear, Industrial Products Division, Akron 16, Ohio.

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GOODYEAR

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Plioweld—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

This Week in STEEL

The Metalworking Weekly

December 8, 1958
Vol. 143 No. 23

EDITORIAL 61

Aspects for business are much rosier, but it's no time to relax; 1959 is sure to be a tough, competitive year.

SPECIAL FEATURE 108

To get a realistic evaluation of numerically controlled machines, STEEL went to the firm that has the largest concentration of such equipment, Boeing Airplane Co. This is must reading if you've been putting off purchase of these machines.

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Independent tool and die shops face lean years. Few courses of action remain to better their fate.

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Consumer spending will be one of the most important elements in the recovery during '59 just as it was in '54.

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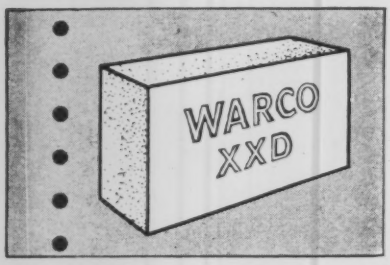
STEEL, the metalworking weekly, is selectively distributed without charge to qualified management personnel with administrative, production, engineering, or purchasing functions in U. S. metalworking plants employing 20 or more. Those unable to qualify, or those wishing home delivered copies, may purchase copies at these rates: U. S. and possessions and Canada, $10 a year; all other countries, $20 a year; single copies, 50 cents. Metalworking Yearbook issue, $2. Published every Monday and copyright 1958 by The Penton Publishing Co., Penton Bldg., Cleveland 13, Ohio. Accepted as controlled circulation publication at Cleveland, Ohio.

Index available semiannually. STEEL is also indexed by Engineering Index, 29 W. 39th St., New York 18, N. Y.

TARGET FOR TODAY

Today, the choice of the right refractory is more important than ever before. That means choosing a refractory with a combination of physical characteristics such as Warco XXD. With lower porosity and higher bulk density, Warco XXD, High Duty Fire Brick, is noted for unusual resistance to thermal shock. Especially recommended for checker brick work in open hearths, hot blast stoves and for use in soaking pit coping tile, Warco XXD is the last word in physical properties that assure greater value per dollar invested.

Dry press process. In standard sizes and many special shapes. Write for details.



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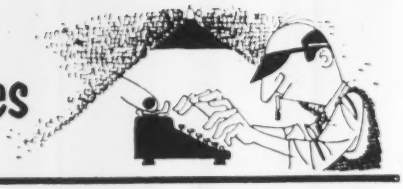


Easy Reading

Ben Franklin is alleged to have remarked that the man he pitied most is a man in a rocking chair in a warm kitchen on a cold and rainy night who does not know how to read. Today, such a man might even be grateful for his illiteracy because he could enjoy his records, radio, and television without worrying about slipping behind in his reading. However, regardless of the importance of reading, persons who were able to read were seldom pampered by printers or publishers, or handwriting experts. The material was lettered or set, and the reader went after it, like a dog after a stick. The stuff could appear in great primer or long primer, medieval Gothic, or Hebrew, or Gaelic, or Arabic, but the handicaps meant nothing to the man who panted after information; he'd read the stuff, or bust.

Some of this tremendous urge to read exists today in men who are straining their eyes and their wits attempting to read the Dead Sea Scrolls. Those parchments were produced about 2000 years ago, rolled up and stuffed into clay jars, and left to wither and molder away in caves by the Dead Sea. Today, these manuscripts are the hottest stuff in the world of writing, as well as the most difficult to read, yet they excite a universal attention.

Where does STEEL fit into this picture? Well, STEEL is the hottest stuff in the world of metalworking (Advt.), but the editors agreed that it should be made easier to read, although it excites a universal attention in its sphere of penetration. They told each other that, even if it were as difficult to read as the Dead Sea Scrolls, metalworking people would read it regardless; however, it would be most inconsiderate to subject busy readers to such a strain. Moreover, proofreaders might be inclined to object if they were required to check primitive Hebrew on rolls of tattered parchment.

Perhaps persons who read STEEL don't have as much time as the scholars who are currently up to their hips in Dead Sea Scrolls. Useful information that appears in the nation's foremost metalworking weekly has to be absorbed in a hurry, so what do you suppose the Committee on General Improvement did? It spread the universally favored "Metalworking Outlook" feature over four pages instead of two, sprinkled in some cartoons and spot illustrations, folded in thumbnail descriptions of pertinent articles, and baked—or, rather printed—the entire mix on canary yellow stock. We don't expect you to roll your eyes, kiss your fingers, and shout "OO-oo- La! La!" when you see this new expanded feature (it makes its first appearance this week, Page 55), but we do have the feeling that you are going to like it.

Value of Change

There's nothing fundamentally wrong with a mansard roof, or a Georgian facade, or a Gothic buttress; their virtues are constant. Yet people change, and architects change their ideas to accommodate their clients. So when we say that the Committee on General Improvement developed certain mutations in STEEL covers and established the style as demonstrated on the copy you now hold, it might not be entirely admissible to declare that the new style is a mighty improvement over the old. Let us say that people change, and it is good for magazines to change with them. The old type of cover served its purpose well, and we expect the new to do the same.

A panel on the left will feature the stuff that calls for immediate attention; a caption, descriptive paragraph, and maybe an illustration will serve to advertise it. The rest of the cover will be a sort of a general contents cover.

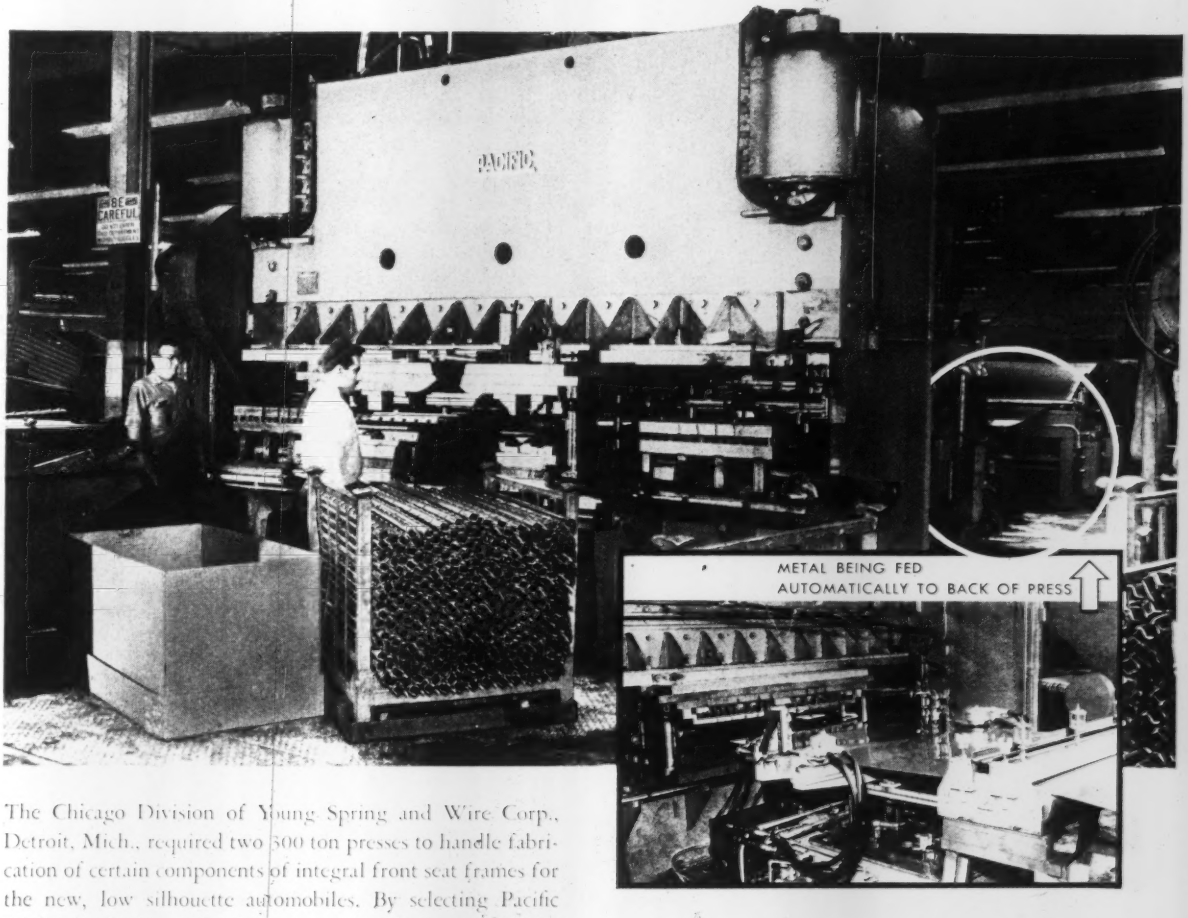
Streight Tok

Careful Joe Lipka, treasurer of the Penton Publishing Co., publisher of STEEL, was cleaning out his files recently, and found a letter of complaint. Dated Oct. 29, 1918, it went like this: "Gentlemen: I will write you ance more inregard to the accont. this ad was ordered by me las december for january from cloumbus ohio and the order was to late for the january issue so it was put in the febuary issue witch i payed at your office at cleveland. then you continued to send me statements and I came back to your office in march and explayned to you wich you tol me you understood and was satisfactory. and I also wrote you and explayned to you. now if I owed this accont you would not have to hound me with your endless line of dons I would bay it the same as I have bayed my bills. ance more I have payed this accont and dont entend to bay it a second time it is like of management on your part now I trully hope you will look into this mattrr and streighten it up."

An understatement, scrawled firmly across the note by the hand of a former Penton auditor, read: "Better charge off. H. O. Taylor."

(Metalworking Outlook—Page 55)

Hydraulic press brake reduces machinery and operational costs for forming large, heavy metal stampings



The Chicago Division of Young Spring and Wire Corp., Detroit, Mich., required two 300 ton presses to handle fabrication of certain components of integral front seat frames for the new, low silhouette automobiles. By selecting Pacific Hydraulic Brakes and using progressive dies coupled with an automatic material feeding system, it became possible to form major components of seat frames at each stroke of press. In a one-man operation, the first press stamps and forms the rear rail . . . the major component of the seat frame . . . from 57½" width material automatically fed through a 9-station progressive die from the back of the press to the front. The second press with two 4-station dies flattens and forms the ends of tubular material used for front seat, split-backs. Hydraulic system holds ram momentarily at the work to distribute tonnage evenly as punches enter material. Pressings are noiseless and extremely accurate.

Pacific Hydraulic Brakes actually cost less than conventional presses for this work. Pacific is a versatile tool profitable for any plant, large or small. It pays for itself from operational savings in blanking, forming, deep drawing, embossing, punching, straightening, stretching, extruding, hot forming or shearing. There is a Pacific Hydraulic Press Brake of the correct size to suit your needs.

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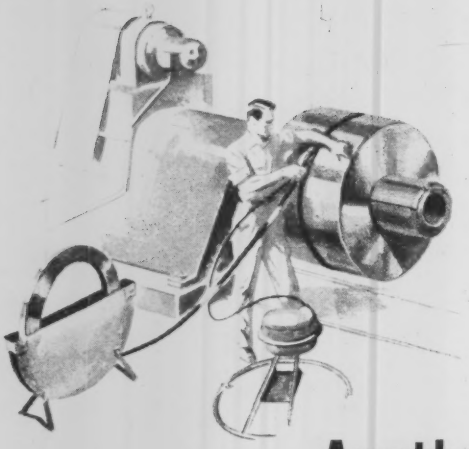


The pneumatic stretcher for extra fast, heavy duty banding

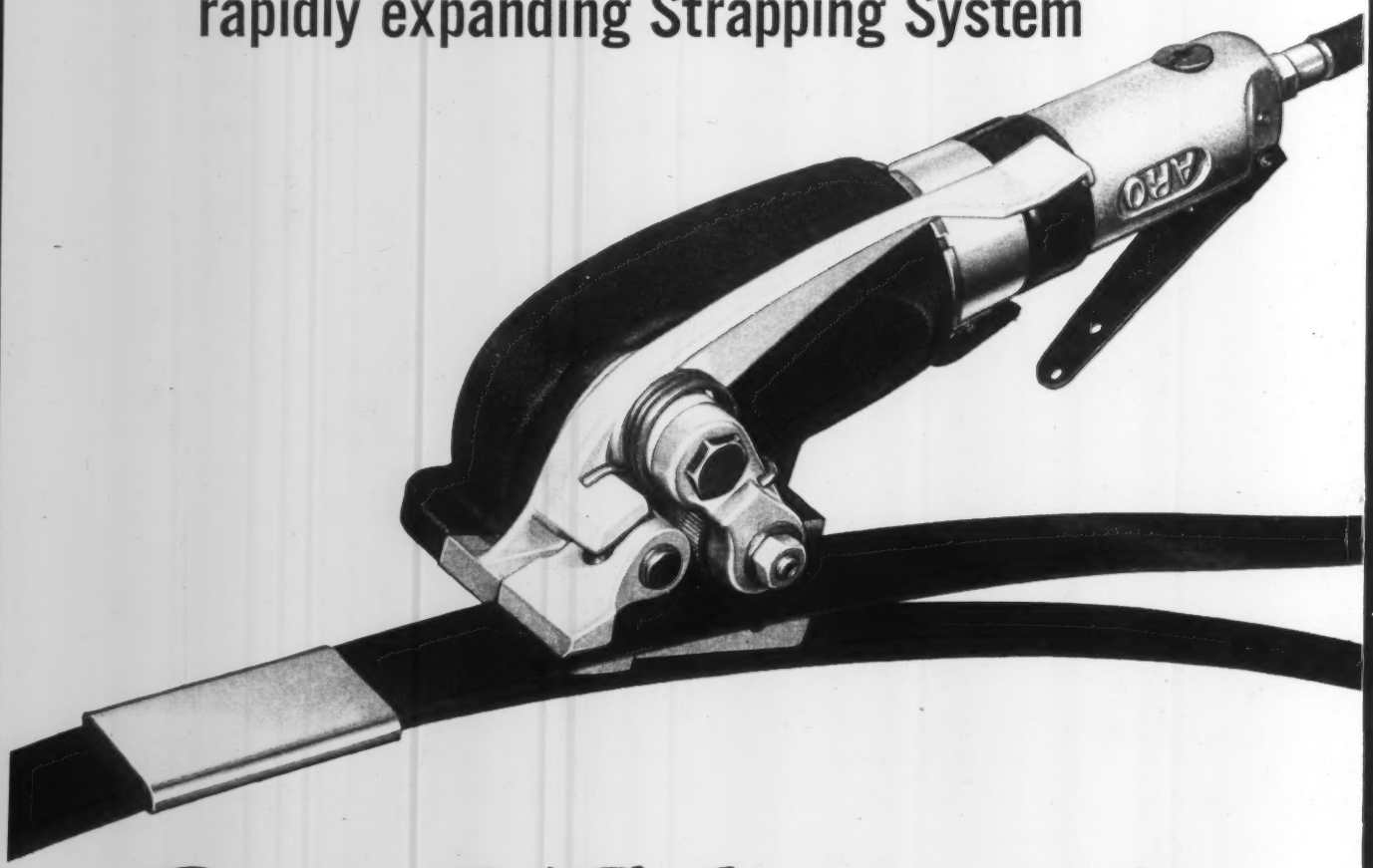
Here's a straight-line, duck-bill pneumatic stretcher that brings production line efficiencies to applications requiring heavy duty banding. Particularly adaptable for use on coils, rounds, hexes and odd-shaped heavy bundles, this new stretcher is a compact, easy-to-use hand tool that threads easily, tensions smoothly and breaks strapping cleanly with a simple forward motion of the wrist.

Why continue with slow, cumbersome, obsolete equipment when this new labor-saver is as near as your Brainard representative . . . it's the PNRC, the newest in Brainard's fast-growing family of fine strapping tools.

For irregular or round incompressible packaging using the narrower widths and lighter gauges, ask your Brainard representative about the equally remarkable PNHK counterpart of the PNRC. The PNHK assures users fast, effortless, controlled tensioned strapping for a wide variety of products now being packaged by manual methods.

Write for detailed description, prices on either the PNRC or PNHK.

Another **NEW TOOL** for Brainard's rapidly expanding Strapping System



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Here's our bearing problem. What do you suggest?

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LOAD (radial, thrust or both)_____

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SPEED_____

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SPECIAL CONDITIONS_____

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Address_____

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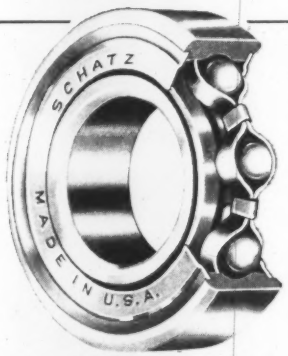
Schatz makes the most varied line of Ball Bearings to fit your needs



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One piece race type with ball cage. Designed to give all the precision you require under certain ratios of load, speed and life expectancy. Available in open type, single or double shielded, single or double sealed with Schatz patented low friction plastic seal. Or with one shield and one seal on special order.

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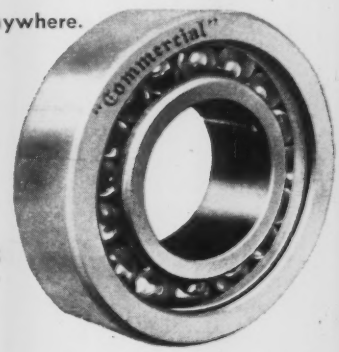

UNGROUND BALL BEARINGS "TYPE A"—Every standard type—radial, thrust and radial thrust.

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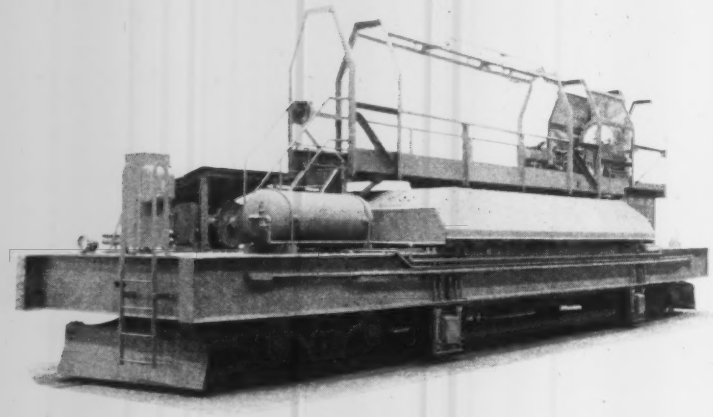
These specially designed units are another example of the ruggedness of Atlas Cars. Their dependability helps maintain the most rigid furnace charging cycles.



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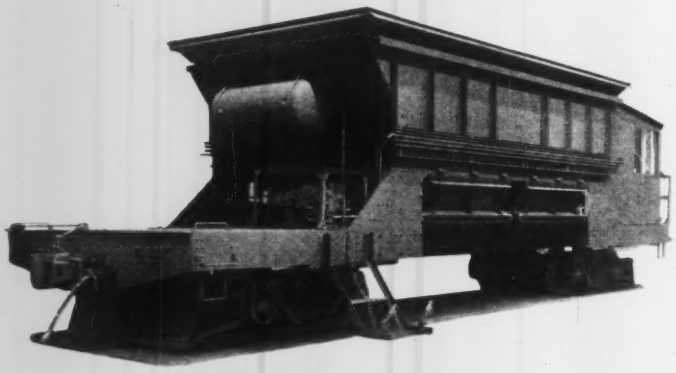

75-TON ORE TRANSFER
Gable Bottom Double Side Dump

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LETTERS
TO THE EDITORS

Requests Stimulating Article

"Get Ready for the New Boom" (Nov. 17, p. 97) has stimulated great interest within our company, and I would appreciate 12 additional copies to distribute to our executive and key supervisory personnel.

STEEL is one of the most widely read magazines we receive. We find your articles most interesting, and like the diversified subjects you cover. Your editorial staff is to be congratulated for assembling the most informative publication in the metalworking industry.

C. W. Alsentzer
Purchasing Agent
Schutte & Koerting Co.
Cornwells Heights, Pa.

Reads in Customer's Office

While waiting in a customer's office recently, I read through your Oct. 27 issue. I was tremendously interested in "Copper and Its Alloys" (p. 75).

Although Cochran Foil Corp. does not roll and process copper, it is a subsidiary of Anaconda Co. Therefore, I feel I should know more about copper and would like to get a copy of the article. It will also be helpful if I can get a copy for our sales promotion manager.

I would like to have my name on your circulation list.

D. W. Sargent Jr.
Manager-Boston District
Cochran Foil Corp.
Louisville

Shrdlu: First Reading

For years, "Behind the Scenes" has been my first reading in STEEL. I enjoy the column, the articles and the ads. STEEL can't be beat for reader interest.

James S. Meeker
Mechanical Engineer
Metropolitan Sanitary District of Greater Chicago
Chicago

Price Index Puzzles Reader

We have been studying the recent Kefauver Report on "Administered Steel Prices," and we are trying to arrive at some conclusions about the price index used.

We would like to know how you arrive

(Please turn to Page 12)

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...increases plant efficiency

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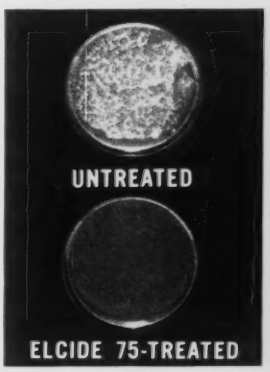
Elcide 75 is a new bacterial inhibitor that controls a wider range of the harmful bacteria that cause emulsion breakdown, corrosion, and odor. This positive control means it is now possible to extend the life of standard duty emulsions up to 5½ times longer than ever before. This longer emulsion life decreases the down time previously spent for recharging, thereby increasing production and labor efficiency. Total soluble oil requirements are less, and waste-oil disposal becomes much less of a problem and expense.

Elcide 75 is safe to employees and machinery. Shop tests show it is nontoxic and safe, and it controls the bacteria that may cause acidic corrosion of machinery and staining of products.

Elcide 75 is more effective than commonly used single inhibitors because it is a combination of antibacterial agents, and includes a powerful new compound related to one of the safest and most effective bacterial inhibitors used in medical surgery today.



Bacterial plate counts prove the killing power of Elcide 75. The light areas shown in the photograph are harmful bacterial colonies that have built up in a normal untreated emulsion in 12 weeks. Notice the emulsion treated with Elcide 75 has been kept clean and clear.

Elcide 75 specifications: *Active Ingredients—Sodium Ethylmercuri Thiosalicylate (Thimerosal) and Sodium o-phenylphenate. Price per gallon—1 gallon polyethylene, $8.50, 5 gallon polyethylene, $8.00, 55 gallon stainless steel, $6.50. Sold only through selected distributors. For more information or to place your order, phone or write:*

ELCIDE 75™

PATENT PENDING

Lilly

Lilly's brand of bacterial inhibitor for cutting fluids

ELI LILLY AND COMPANY, AGRICULTURAL AND INDUSTRIAL PRODUCTS DIVISION, INDIANAPOLIS 6, INDIANA. TELEPHONE: MELROSE 6-2211

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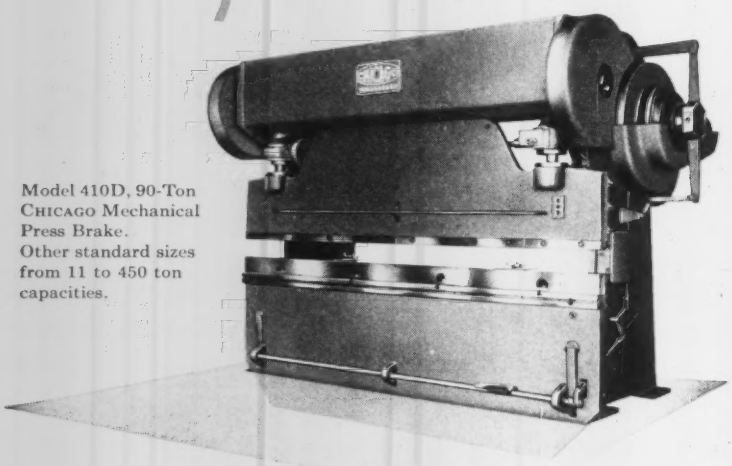
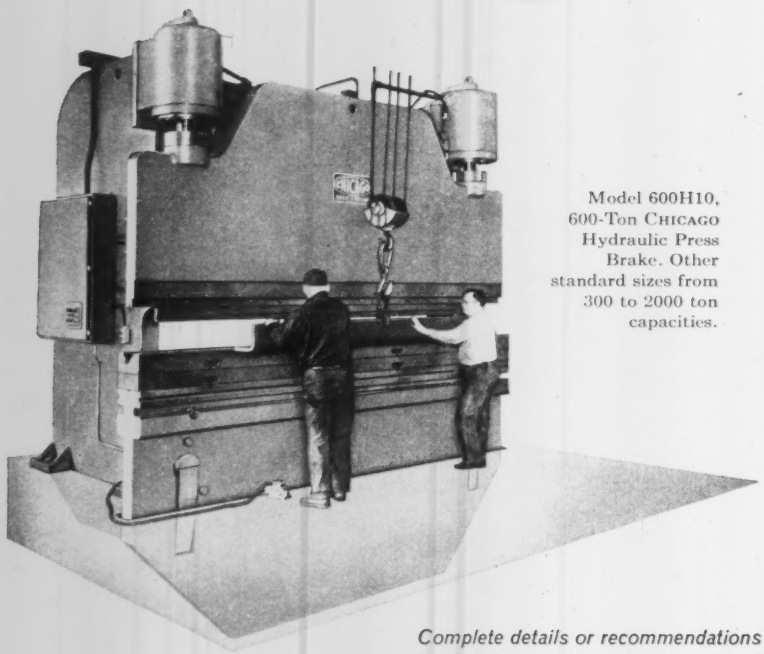


Model 410D, 90-Ton CHICAGO Mechanical Press Brake. Other standard sizes from 11 to 450 ton capacities.



Model 600H10, 600-Ton CHICAGO Hydraulic Press Brake. Other standard sizes from 300 to 2000 ton capacities.

Complete details or recommendations on any press brake work upon request

8439

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Special Forming Machines

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7458 S. Loomis Blvd., Chicago 36, Illinois

LETTERS

(Concluded from Page 10)

at your finished steel-weighted price composite.

Also, we have been unable to ascertain how the Kefauver Committee or the Joint Economic Committee tied in the price index with the unit production index or with the unit labor cost figures. Any information you have would be appreciated.

Harleston R. Wood
President
Alan Wood Steel Co.
Conshohocken, Pa.

• *Details will be sent.*

PA Wants Engine Lathe Report

Do you know of any published investigation or report on the many types of engine lathes manufactured in the U. S., giving their ratings or specific advantages to machine shop use?

R. G. Walsh
Purchasing Agent
Kollmorgen Optical Corp.
Northampton, Mass.

• *We are sending you* STEEL's *Machine Tool Buyers Guide. We believe it is the only publication which lists machine tools by type and size rather than by manufacturer.*

Wants To Catch Up on Series

Unfortunately, I find myself at the bottom of a rather long pass-along list for STEEL. As a result, I have just received the June 16 issue which carried "Pricing for Profit" (p. 87). Subsequent issues have contained additional articles in this series which are missing from my personal file. May I have a copy of each article?

Roy Mynsberge
Administrative Assistant
Design & Drafting
Bendix Products Div.-Missiles
Bendix Aviation Corp.
Mishawaka, Ind.

Metal Selector Aids Work

Please send a reprint of "Metal Selector, 1958 Edition" (Oct. 20). I am a tool designer in the aircraft industry, and I believe it will be helpful to me.

Alfonse N. Leporé
Bloomfield, Conn.

• • •

This is an excellent compilation, and we feel it will be extremely useful to us here.

Jack J. Bodzin
Research Metallurgist
Engineering Laboratory and Research Dept.
Detroit Edison Co.
Detroit

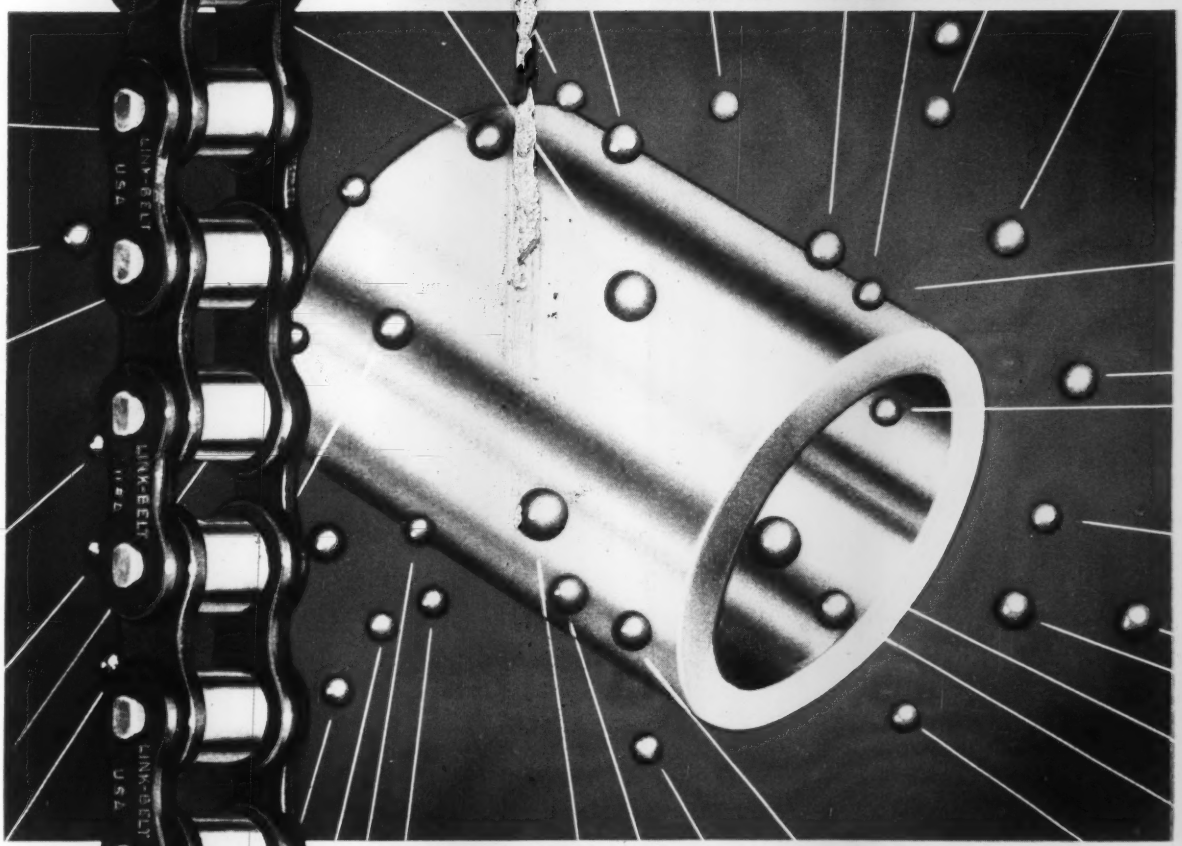
• • •

Your Metal Selector is valuable to our sales department as well as our customers.

C. E. Workman
Buffalo District Sales Dept.
Wickwire Spencer Steel Div.
Colorado Fuel & Iron Corp.
Buffalo

Shining example of "extra" chain quality

SHOT-PEENED ROLLERS



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Rollers for Link-Belt precision steel roller chain are now finished by a special burnishing process to a "Silver-Brite" luster! And this is accomplished *without grinding away the benefits imparted by shot-peening*—a Link-Belt process that cold works the metal and provides extra fatigue life.

Many more special Link-Belt "extras" contribute to the dynamic strength so important for today's heavy loads and high speeds: close heat-treat control . . . lock-type bushings . . . pitch hole preparation . . . pre-stressing.

Ask your Link-Belt office or authorized stock-carrying distributor for new 154-page Catalog 2657—the most complete roller chain data book ever compiled.

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LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office, New York 7; Australia, Marrickville (Sydney); Brazil, Sao Paulo; Canada, Scarboro (Toronto 13); South Africa, Springs. Representatives Throughout the World. 14,978

Republic ELECTRUNITE Mechanical Tubing is used in four locations across the top of the automatic apparatus that picks up and sets the bowling pins in place. The AMF Automatic Pinspotter is manufactured by the American Machine & Foundry Company, Brooklyn, New York

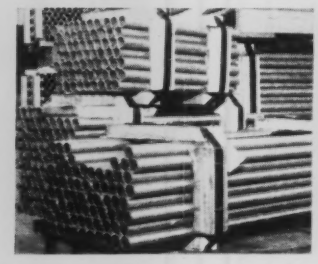
AMF . . . builds a better pinspotter for better bowling with Republic ELECTRUNITE Mechanical Tubing

On the initial order, Republic ELECTRUNITE® Mechanical Tubing saved American Machine & Foundry Company $34,000 in manufacturing their famous AMF Automatic Pinspotter.

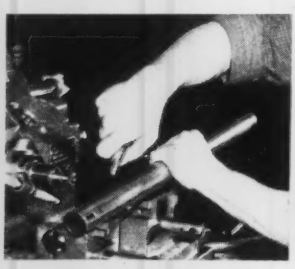
AMF had been using tubing that required a boring operation on each end of the tube and centerless grinding on the O.D.

Because Republic's ELECTRUNITE Mechanical Tubing met AMF's O.D. tolerance requirements, the company was able to eliminate the boring and grinding operations. This resulted in a savings of $15,000 in fabricating operations. Another $19,000 was saved on the cost of ELECTRUNITE as compared with the tubing used previously.

In uniformity and quality, in fabricating, in original costs, Republic's ELECTRUNITE Mechanical Tubing can save you time and money, too! Call your Republic representative, or write today.

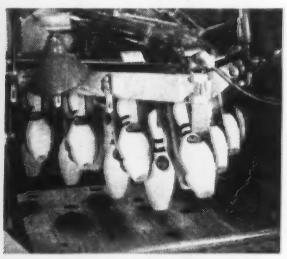


Republic ELECTRUNITE Mechanical Tubing is delivered, cut to length, ready for fabricating. ELECTRUNITE Tubing is "electrically welded" resulting in built-in uniformity.



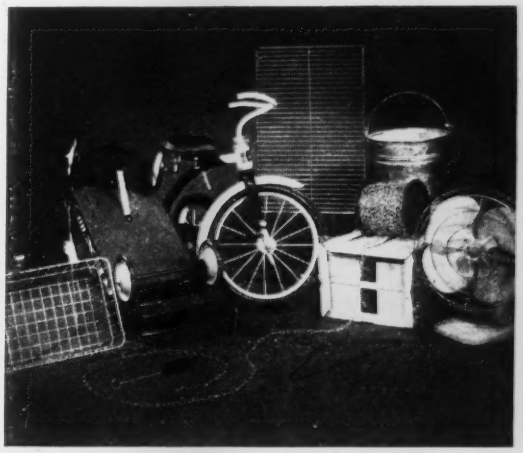
Slots to hold spotting cups in place are cut into ELECTRUNITE Tubing by machine. Concentricity of the ELECTRUNITE assures easy fabrication and smooth mechanical operation.

Drilling and cutting complete, the ELECTRUNITE Tubing is ready for assembly. Lightweight ELECTRUNITE offers uniform wall thickness, strength, ductility for greater serviceability.

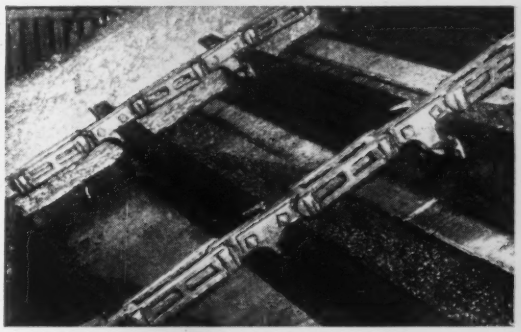


Sensitivity in setting off-spot pins is the result of design and engineering, highest quality workmanship, and highest quality materials, such as Republic's ELECTRUNITE Tubing.

REPUBLIC NYLOK® FASTENERS SAFEGUARD PERFORMANCE SPECIFICATIONS. Republic fasteners are used extensively on Gemco Rotary, Reel, and Riding Power Lawn Mowers. Inset shows blade assembly securely locked to engine shaft with Nylok Cap Screw. An added advantage of Republic Nylok Bolts and Cap Screws is their ability to seal against fluid escape when wrenched tight. Nylon pellet in bolt body blocks flow of fluid along helical threaded path. Send for data.



REPUBLIC MANUFACTURERS' COARSE WIRE to meet every production need. Box Binding and Stapling, Brush Handle, Chain, Garment Hanger are only a few of the qualities regularly produced. Large tonnages are shipped to manufacturers of fan guards, wire partitions, concrete reinforcing specialties, plated shelves, racks and grilles, and numerous other products. Republic wire metallurgists are available to help you in solving production problems. Write today.



REPUBLIC HIGH STRENGTH STEEL IMPROVES SERVICE LIFE for many types of equipment. In the bottom of this conveyor, for example, it provides excellent resistance to abrasion and corrosion. Far less frequent replacement is required as compared with a bottom made of ordinary steel. And, its high strength-to-weight ratio allows use of lighter gages. Send for details.

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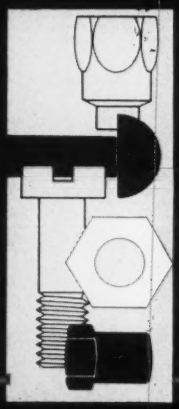

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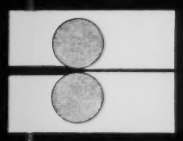

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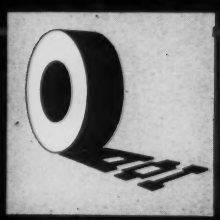

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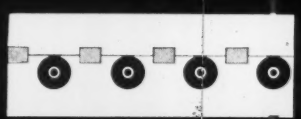

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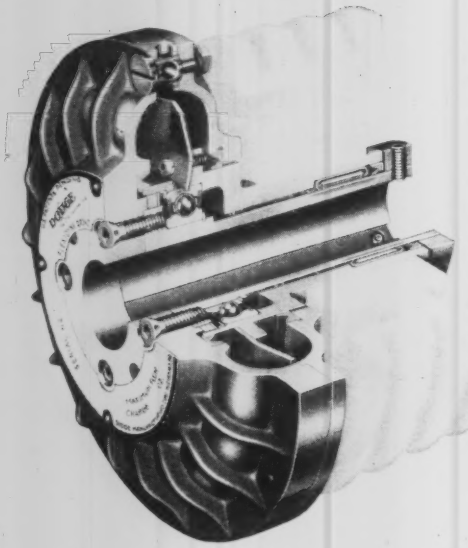
- ☑ Clutch trouble?
- ☑ Breakage of transmission parts due to instantaneous shock loads?
- ☑ Damage and recurring down-time from overloads?



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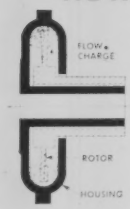
Flexidyne is the new way to start loads *smoothly*—to protect against shock and overload—to save power—all *without any sacrifice of efficiency at full load!*

This revolutionary development is ushering in "the day of the soft start"—which can mean thousands of dollars to you in equipment savings and in better, more economical operation.

Flexidyne is available, off the shelf, in Drives and Couplings. Capacities range from fractional to 1,000 hp. Ask your local Dodge Distributor or write us for technical bulletin.

DODGE MANUFACTURING CORPORATION, 4400 Union St., Mishawaka, Ind.

HOW FLEXIDYNE WORKS



The "dry fluid" in Flexidyne is tiny heat-treated steel shot. A measured amount, called the "flow charge," is contained in the housing, which is keyed to the motor shaft. Inside the housing is a rotor, free to revolve relative to the housing, but connected to the load.

When the motor is started, centrifugal force throws the flow charge to the perimeter of the housing, packing it between the housing and the rotor, which transmits power to the load. Initial slippage is momentary. Housing and rotor become locked together and achieve full load speed without slip and at 100% efficiency.

CALL THE TRANSMISSIONEER — your local Dodge Distributor. Factory trained by Dodge, he can give you valuable help on new, cost-saving methods. Look in the *white* pages of your telephone directory for "Dodge Transmissioneer."

DODGE

of Mishawaka, Ind.

"The Board balked at first...

but I convinced them that now was a good time to buy!"

When machine tool builders work with smaller backlogs they're naturally more efficient and can make better deliveries...are more able to control costs ...more able to render the many *extra* custom engineering services that disrupt regular production during peak schedules. As a matter of fact, many progressive buyers are at their busiest now...taking advantage of the sound buying position the economy gives them as it pauses for its breath...seizing the opportunity to get ready for tomorrow today.

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Can a better spring save you money?

. . . then put American Spring Engineering Research Service to work for you!

WOULD you like the springs you now use to last longer? Would you like to cut their cost? Do you need design assistance on a difficult new spring application? *American Steel & Wire may be able to help you.*

We maintain complete spring testing facilities to help you solve any spring problem. Our spring engineering specialists can help you improve the *design* of your spring. We can help you determine the best possible *steel* to use. Then, we can completely check spring performance. We can simulate any spring operating condition and verify these recommendations in terms of improved service in your product.

Hundreds of companies have taken advantage of this service and have profited from it. Why don't you? Just write American Steel & Wire, 614 Superior Avenue, N. W., Cleveland 13, Ohio.

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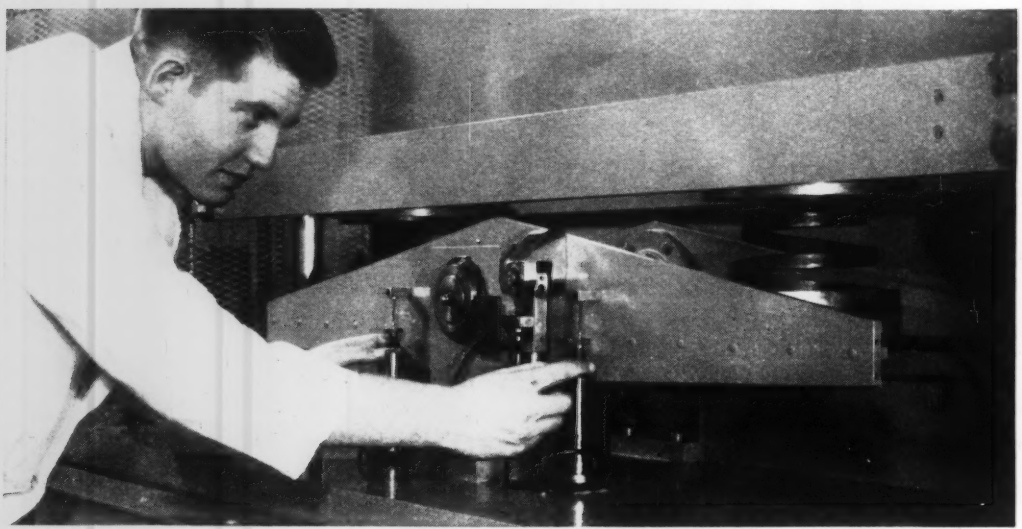
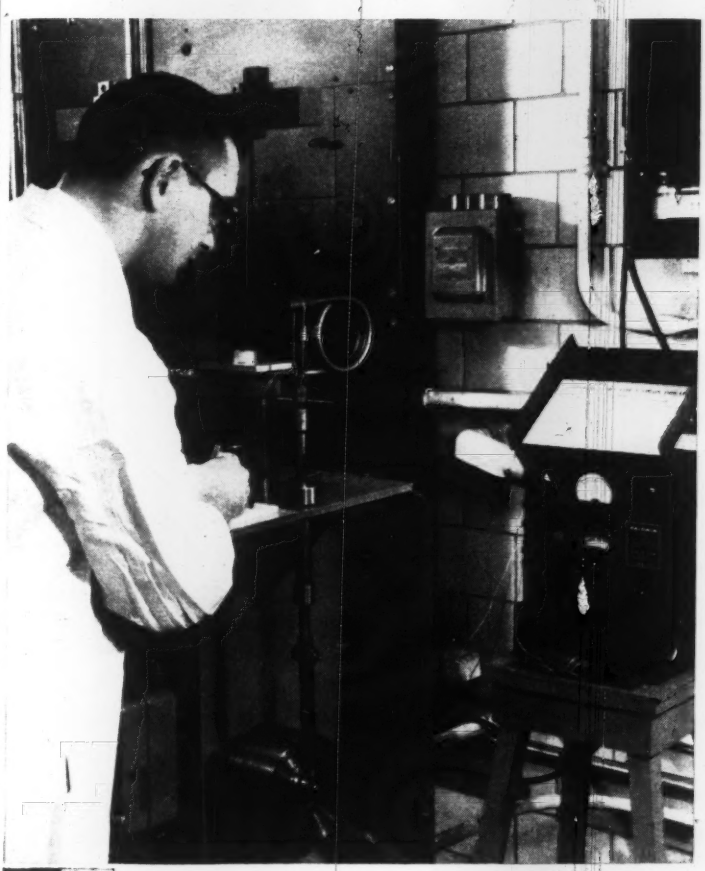


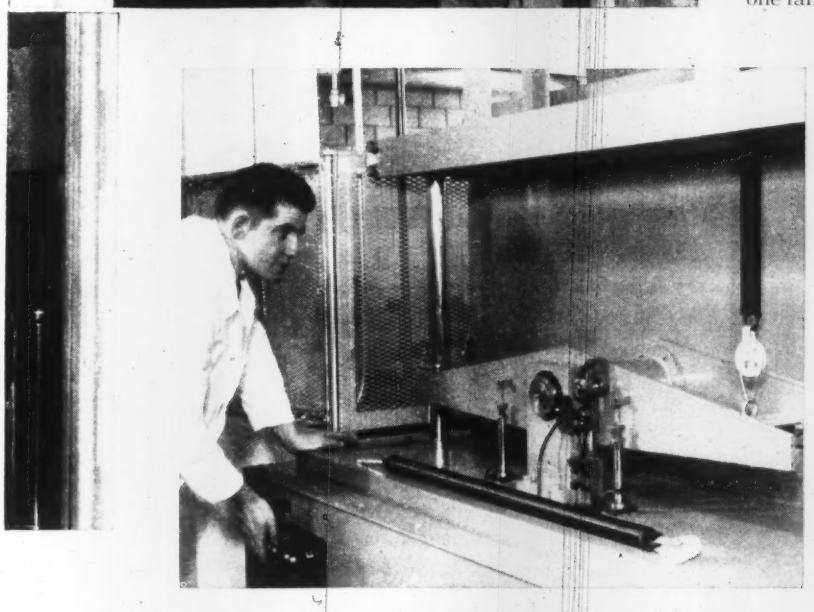
Heavy-Duty Clutch Springs Last Longer Now—Thanks to AS&W Spring Research!

The Lipe-Rollway Clutch Division, Lipe-Rollway Corporation, Syracuse, New York, asked AS&W Spring Engineering Research Service to determine if design change would lengthen the life of the flat wire compression springs used in their clutches. AS&W recommended design changes that greatly increased the spring life.



AS&W Spring Tests Make Possible New Design Rocking Chair!

40,000 springs—not one failure—American Steel & Wire helped Homecrest Company, Wadena, Minnesota, design a round wire helical torsion spring for an unusual new type of swivel rocking chair. To date, 20,000 of these chairs have been sold, but not one failure of the 40,000 springs has been reported.



Design Change Increases Operating Life of Garage Door Springs!

The Steel Door Corporation, Birmingham, Mich., asked the AS&W Spring Engineering Research Service for a statistical evaluation of the fatigue life of this extension hook-type spring. As a result of the test, AS&W recommended a design change which has materially lengthened the operating life of the spring.

American Steel & Wire Division of USS United States Steel

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Amusement park operators* know that their rides must be exciting to be successful. But with the lives of riders and onlookers at stake, operators rely on *quality* wire rope to ensure . . .

a safe ride

Safety comes first, wherever wire rope is used. You may save a few pennies on the purchase of a "bargain" rope. But it will cost you *more* than you bargained for, if it results in injured personnel and wrecked equipment. Make sure you get *quality* wire rope—buy Wickwire Rope.

**Picture shows the Rocket Ride at Palisades Amusement Park, Fort Lee, N. J. Wickwire Rope provides the only support for each of these planes.*

CF&I

WICKWIRE ROPE — A CF&I PRODUCT

LOOK FOR THE YELLOW TRIANGLE

PRODUCT OF WICKWIRE SPENCER STEEL DIVISION
THE COLORADO FUEL AND IRON CORPORATION

THE COLORADO FUEL AND IRON CORPORATION—Albuquerque • Amarillo • Billings • Boise • Butte • Denver El Paso • Farmington (N. M.) • Fort Worth • Houston • Kansas City • Lincoln • Odessa (Tex.) • Oklahoma City Phoenix • Pueblo • Salt Lake City • Tulsa • Wichita • **PACIFIC COAST DIVISION**—Los Angeles • Oakland • Portland San Francisco • San Leandro • Seattle • Spokane • **WICKWIRE SPENCER STEEL DIVISION**—Boston • Buffalo • Chattanooga Chicago • Detroit • Emlenton (Pa.) • New Orleans • New York • Philadelphia 6347

CALENDAR
OF MEETINGS

Dec. 8-10, American Nuclear Society: Winter meeting, Sheraton-Cadillac Hotel, Detroit. Society's address: Chicago 1, Ill. Executive secretary: Octave J. DuTemple.

Dec. 10-11, Industrial Truck Association: Annual meeting, Roosevelt Hotel, New York. Association's address: 526 Washington Loan & Trust Bldg., Washington 4, D. C. Managing director: William Van C. Brandt.

Dec. 12-14, Association of Steel Distributors Inc.: Annual meeting, Hotel Pierre, New York. Association's address: 29 Broadway, New York 6, N. Y. Counsel: Morris Rosoff.

Dec. 28-31, American Marketing Association: Winter meeting and exhibit, Morrison Hotel, Chicago. Association's address: 27 E. Monroe St., Chicago, Ill. Secretary: Schuyler F. Otteson.

1959

Jan. 11-14, Institute of Scrap Iron & Steel Inc.: Annual convention, Waldorf-Astoria, New York. Institute's address: 1729 H St. N.W., Washington 6, D. C. Executive vice president: Edwin C. Barringer.

Jan. 12-16, Society of Automotive Engineers: Annual meeting and engineering display, Sheraton-Cadillac and Statler-Hilton Hotels, Detroit. Society's address: 485 Lexington Ave., New York 17, N. Y. Secretary: John A. C. Warner.

Jan. 14-16, American Management Association: Research and development conference, Roosevelt Hotel, New York. Association's address: 1515 Broadway, New York 36, N. Y. R&D's division's manager: Philip Marvin.

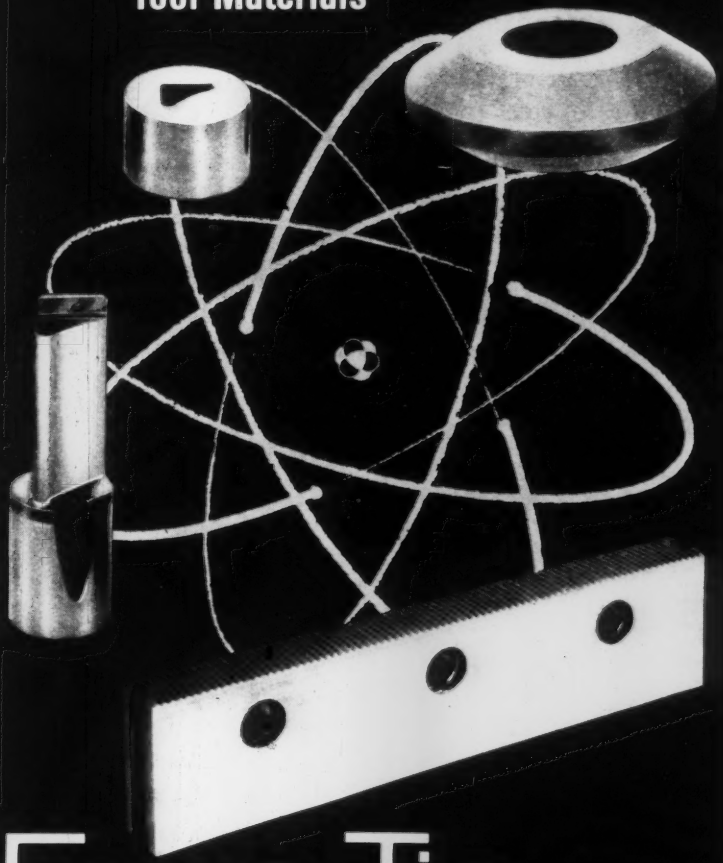
Jan. 14-18, National Tool & Die Manufacturers Association: Winter board meeting, Emerald Beach Hotel, Nassau, Bahama Islands. Association's address: 907 Public Square Bldg., Cleveland, Ohio. Executive vice president: George S. Eaton.

Jan. 15, Malleable Founders' Society: Semi-annual meeting, Hotel Sheraton-Cleveland, Cleveland. Society's address: 1800 Union Commerce Bldg., Cleveland 14, Ohio. Executive vice president: Lowell D. Ryan.

Jan. 19-20, Industrial Heating Equipment Association: Annual meeting, Hotel Sheraton-Cleveland, Cleveland. Association's address: Associations Bldg., Washington 6, D. C. Secretary: Robert E. Fleming.

Jan. 19-21, Southern Industrial Distributors Association: Winter meeting, Biltmore Hotel, Palm Beach, Fla. Association's address: 1626 Fulton National Bank Bldg., Atlanta, Ga. Secretary-treasurer: E. L. Pugh.

A completely new concept in Tool Materials



Ferro-Tic (with proven performance)

the only machinable carbide in existence!

FOR: Blanking, Laminating, Deep Drawing and Heading Dies, Arbors, Core Rods, Wear Parts, etc.

FERRO-TIC combines the fabricating advantages of steel with the wear-resistance of carbide. In the annealed, completely dense state, FERRO-TIC can be machined with high-speed steel tools on conventional tool room equipment; thus, the need for costly diamond grinding is eliminated. Once hardened, by oil quenching from 1750°F, FERRO-TIC is extremely hard and wear-resistant. FERRO-TIC stock blanks can be fabricated into long-wearing carbide components, using available tools and skills without delay!

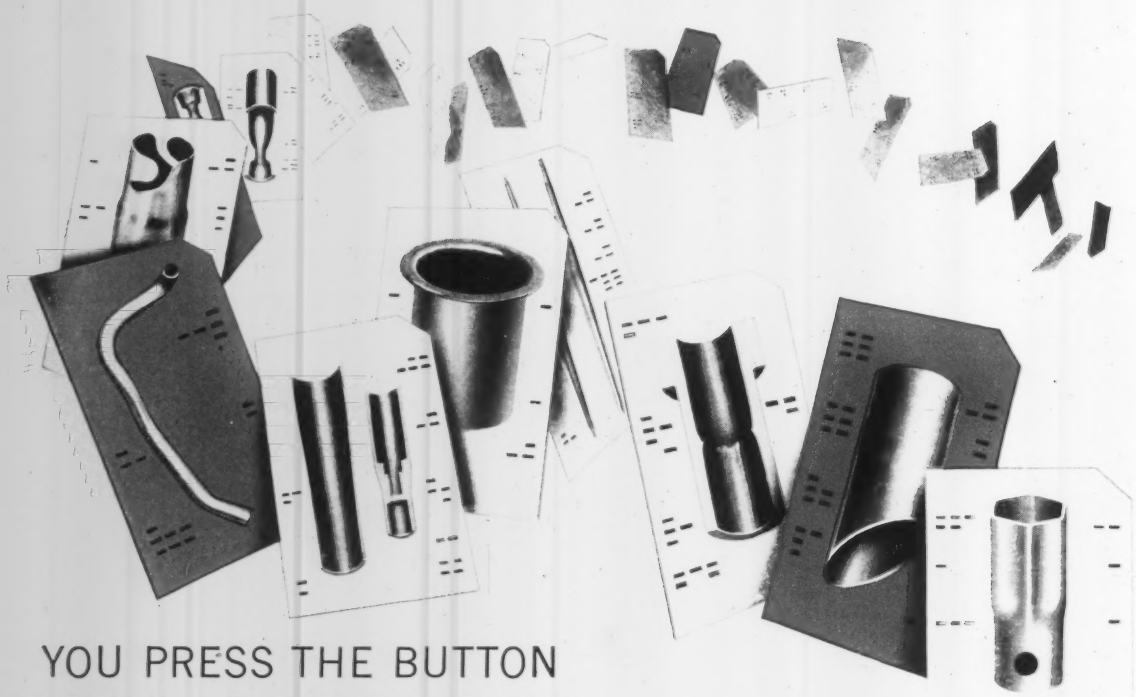
FERRO-TIC can be
- TURNED
- DRILLED
- MILLED
- SAWED
- TAPPED

AGENTS THROUGHOUT THE U.S.A.

Write or telephone for complete information:

SINTERCAST
CORPORATION OF AMERICA
136 Woodworth Avenue, Yonkers 2, N.Y. YOnkers 9-6767

When you buy from Ohio Seamless



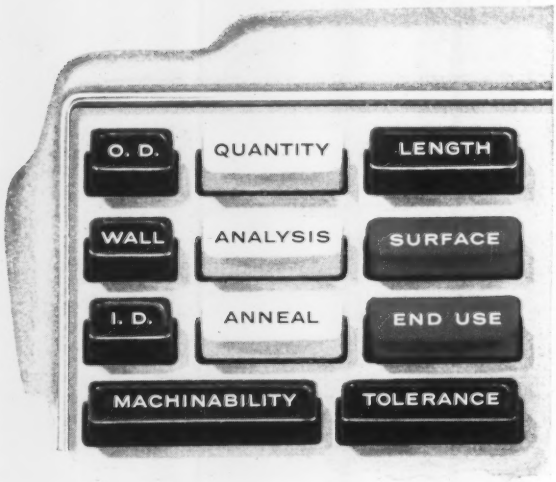
YOU PRESS THE BUTTON
OHIO SEAMLESS
DOES THE REST

Buying steel tubing from Ohio Seamless doesn't cost—it *pays*. Our minimum quantities are generally smaller than you may realize . . . often as small as 100 to 150 feet, in certain seamless grades and sizes.

When you buy from us, you're dealing with tubing *experts* . . . men who can recommend the *exact* Ostuco Tubing to suit your product and processes. There's no compromise on analysis, size, anneal, etc.

Advantages of buying from Ohio Seamless multiply, the closer you examine them. Our single-source service eliminates headaches of interplant shipments . . . possible errors . . . multiple purchase orders and invoices. Ohio Seamless keeps your production lines humming because you get *precisely what you want*.

For proof, contact our nearest sales office or the plant at *Shelby, Ohio—Birthplace of the Seamless Steel Tube Industry in America*.



SALES OFFICES: BIRMINGHAM • CHARLOTTE • CHICAGO (Oak Park) CLEVELAND • DAYTON • DENVER • DETROIT (Ferndale) • HOUSTON LOS ANGELES (Lynwood) • MOLINE • NEW YORK • NORTH KANSAS CITY PHILADELPHIA (Wynnewood) • PITTSBURGH • RICHMOND • ROCHESTER ST. LOUIS • ST. PAUL • ST. PETERSBURG • SALT LAKE CITY • SEATTLE TULSA • WICHITA

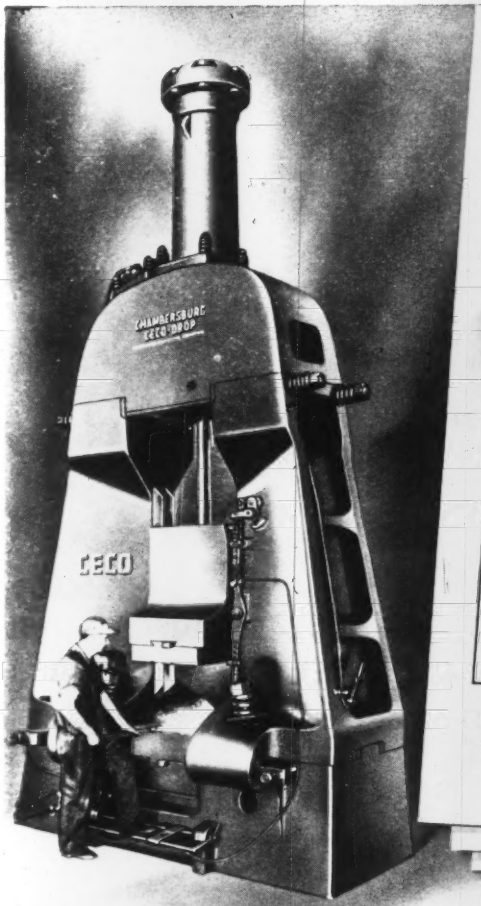
CANADA: RAILWAY & POWER ENGR. CORP., LTD.

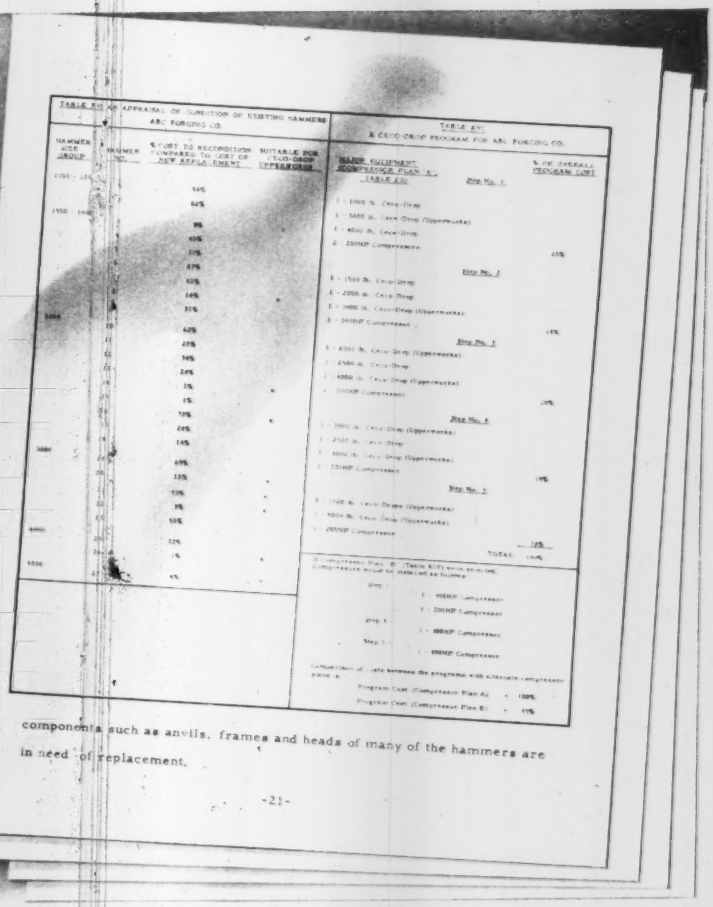
EXPORT: COPPERWELD STEEL INTERNATIONAL COMPANY
225 Broadway, New York 7, New York

FIFTY YEARS
OSTUCO TUBING
1908 1958

OHIO SEAMLESS TUBE DIVISION
of Copperweld Steel Company SHELBY, OHIO

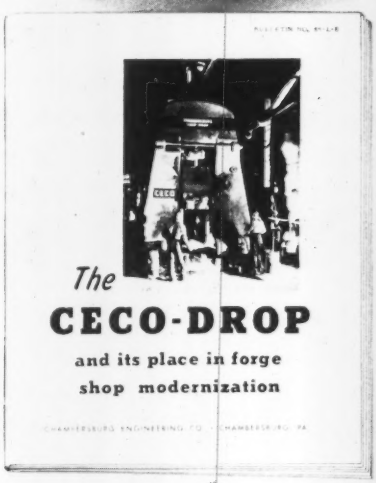
Seamless and Electric Resistance Welded Steel Tubing • Fabricating and Forging





components such as anvils, frames and heads of many of the hammers are in need of replacement.

-21-



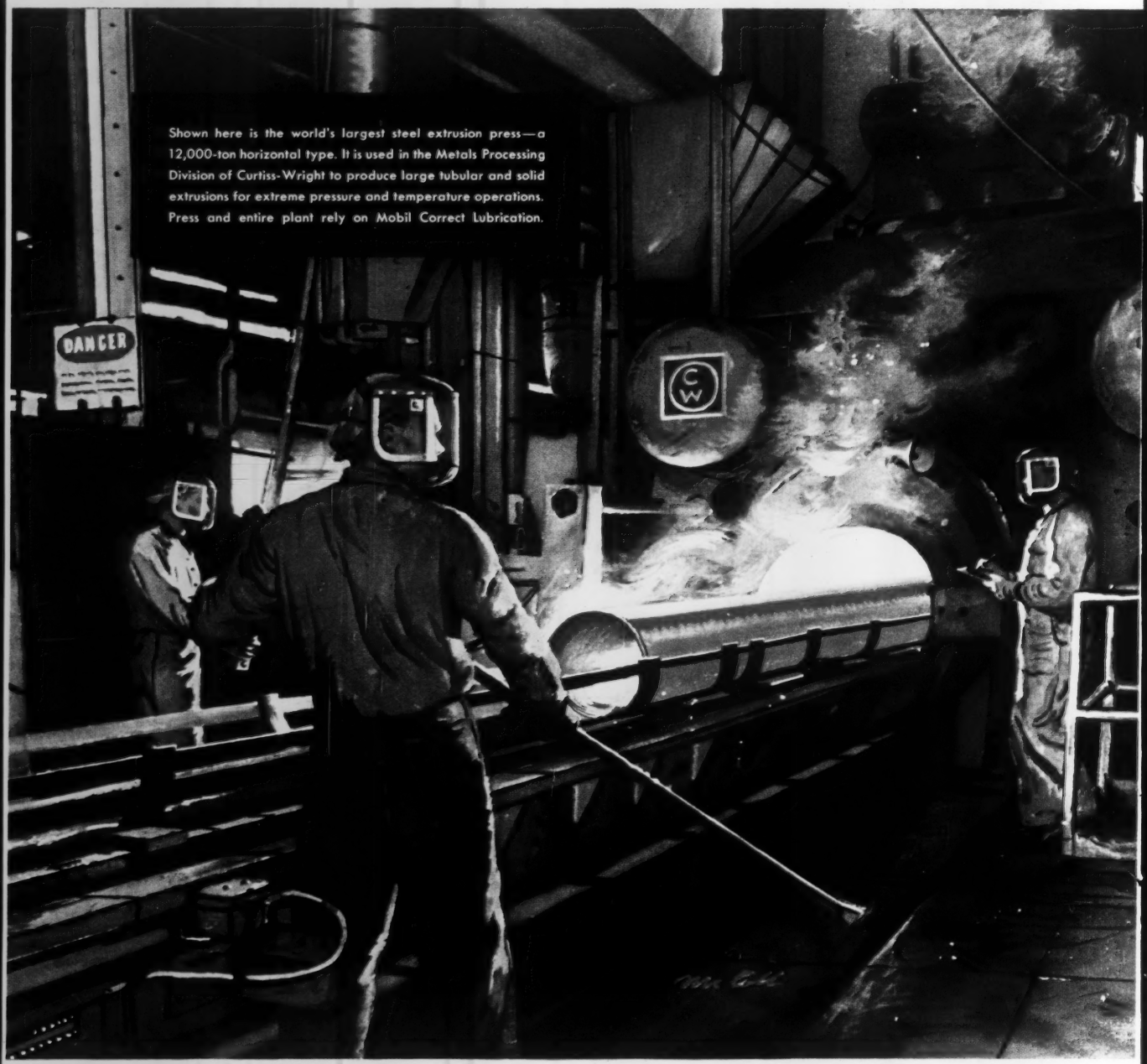
A Realistic Approach to Forge Shop Modernization

During the past few years, mounting competition has caused forge shop managers to seek ways to further increase production and reduce costs. A number have scrapped their old board hammers replacing them with Ceco-Drops, the modern piston-lift gravity-drop hammer. These shops have thus placed themselves in a position to get more business—and they are getting it! ● A wealth of helpful information is available in Chambersburg's new 28 page forge shop modernization bulletin. Based on studies made in prominent forge shops, this publication assists you to formulate your own step-by-step modernization program. Write for a copy today.

CHAMBERSBURG ENGINEERING COMPANY · · CHAMBERSBURG, PA.

Correct Lubrication in Action...

How Mobil saved



Shown here is the world's largest steel extrusion press—a 12,000-ton horizontal type. It is used in the Metals Processing Division of Curtiss-Wright to produce large tubular and solid extrusions for extreme pressure and temperature operations. Press and entire plant rely on Mobil Correct Lubrication.

Mobil

Complete Engineering Program
Proved Petroleum Products

Mobil

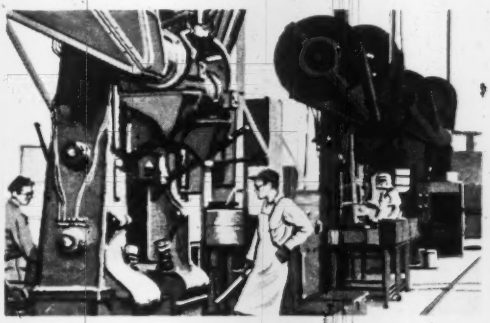
SOCONY MOBIL OIL CO., INC., and Affiliates: MAGNOLIA PETROLEUM CO., GENERAL PETROLEUM CORP., MOBIL OVERSEAS OIL CO., INC.

Curtiss-Wright $8,589

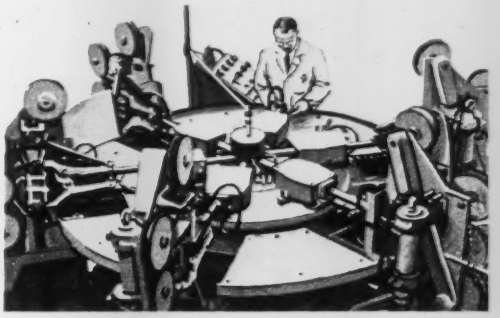
Every time Curtiss-Wright's Metal Processing Division receives a lubricant shipment a big savings is made. Why? Because a Mobil man suggested a new purchasing pattern which brought substantial discounts. Another recommendation saved $1,152 in the company's forging shop.

Here are but two instances of Mobil's imaginative engineering service—an important part of *Correct Lubrication.* Alert, qualified engineers in this plant—*but not on the payroll*—have helped save over $8,589.78 in the last year alone. They have worked closely with Curtiss-Wright engineers, setting up maintenance systems, recommending products and methods that have cut downtime . . . improved production in numerous ways.

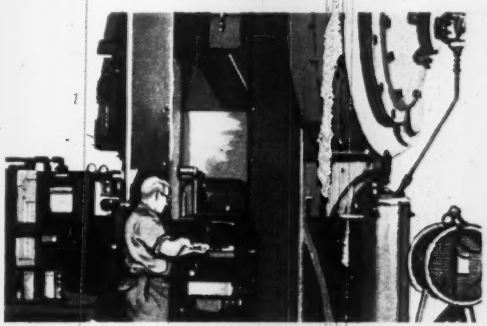
If you purchase lubricants . . . if you're interested in improving company profits . . . it will pay you to investigate Mobil *Correct Lubrication.* This comprehensive lubrication program often more than pays for itself—in profits!



Bearings on drop hammers in Curtiss-Wright's forging shop failed after ten months. Mobil recommended a grease that extended bearing life five years . . . saved $1,152 every ten months.



Curtiss-Wright saves by re-using hydraulic oil as coolant for polishing machine. This saving is part of oil reclamation program organized by Mobil and plant lubrication supervisor. Altogether savings total $5,392 annually.

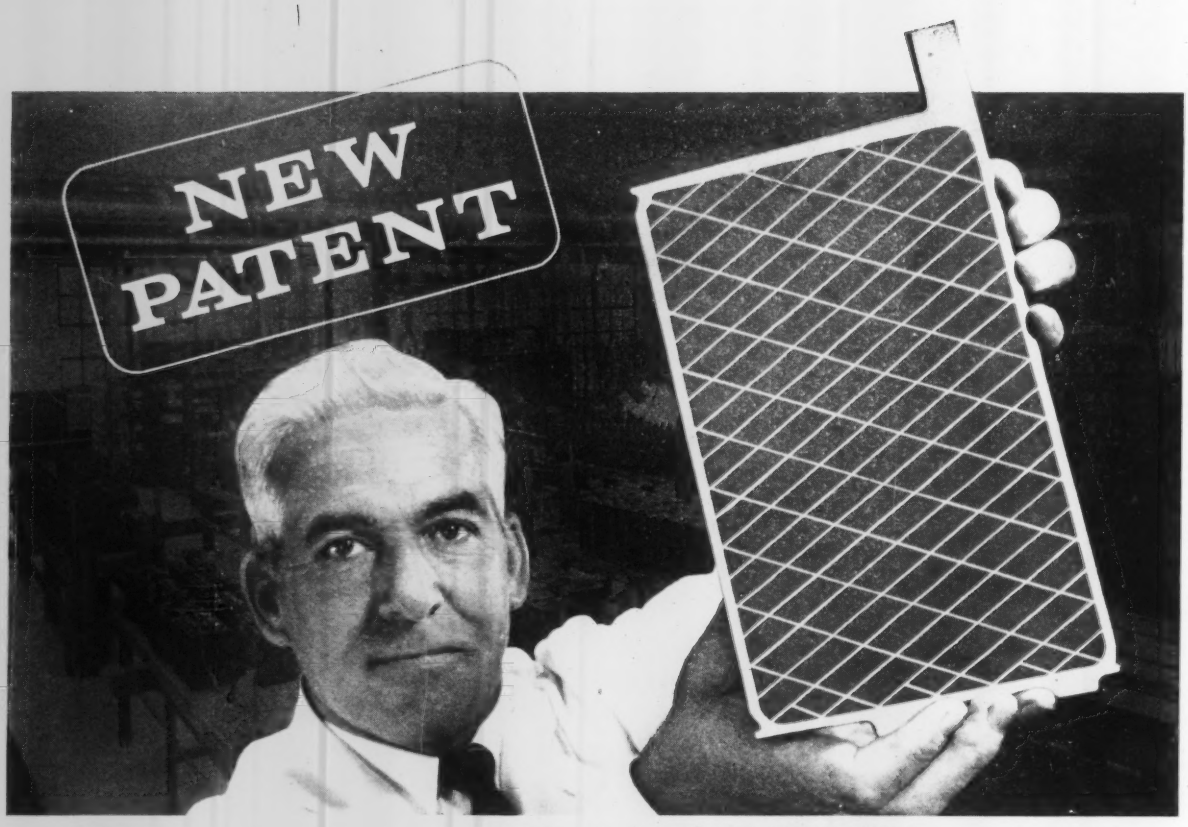


Bull gears on giant presses required application of grease every week. Mobil recommended improved product that extended application period to monthly intervals . . . cut grease consumption 76% . . . cut application cost $665 per year.

Cooling and lubricating emulsion on cut-off saw broke down into curdly mass. Mobil laboratory analysis pinpointed contamination source. Adding an inexpensive chemical eliminated shutdown and cleaning operation.

Correct Lubrication

Another reason You're Miles Ahead with Mobil!



The New *gould* SILCONIC Plate Lengthens Battery Life 10-25%

Two distinct improvements:

1. Gould has developed a new patented (July 1958) process for introducing Silver-Cobalt into the active materials of the positive plates of Motive Power Batteries.

The temporarily soluble silver-cobalt sulphates, when added to the active materials, migrate to all positive grid members.

The Sulphates collect on the grid members to form an insoluble oxide surface or protective sheath which is impervious to acid and oxygen attack.

2. In order to insure a homogeneous grid completely free of flaws, a carefully determined amount of arsenic is added to the regular metal. This produces a smooth flowing metal during the casting operation which results in an extremely dense and uniform grid.

By selectively adding the silver-cobalt and arsenic to the plate, Gould is able to produce the new *SILCONIC* positive plate . . . a Gould exclusive.

Gould Industrial Truck Batteries with Silconic Plates resist corrosion, hold their charge and last longer.

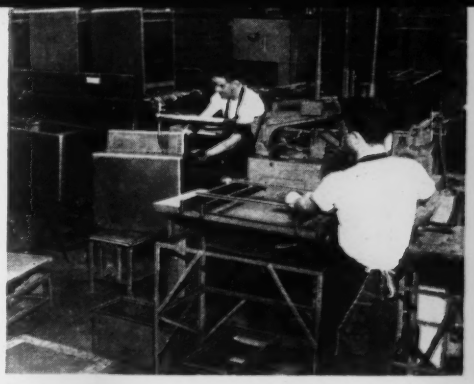
HOLDS CHARGE LONGER. In those applications where batteries are idle for periods of time the *SILCONIC* Plate is ideal. This Silver-Cobalt coating prevents migration of materials to the negative plate, effectively reducing self discharge within the cell.

MIGRATION OF SILVER-COBALT ATOMS. The migration of Silver-Cobalt atoms continues throughout battery life, offering continuous resistance to the corrosive attack of acid and oxygen. This continuous effect is the result of a solid state migration of the Silver-Cobalt which penetrates deeper and deeper into the grid metal during battery operation, thus prolonging the life of the *SILCONIC* Plate.

LONG-FULL SHIFT OPERATION ASSURED. Comparative tests between *SILCONIC* and conventional plates prove that the *SILCONIC* Plate maintains maximum capacity for a considerably greater portion of its service life, retards the tendency toward grid growth, assures longer full shift operation of batteries.

Write for complete data or call your local Gould representative. He's listed under "Batteries Industrial" in the yellow pages. Gould-National Batteries, Inc., Trenton 7, N. J.

More Power to you from Gould



At the ASE plant, Youngstown Cold-Rolled Sheets are being spot-welded—after stamping and drawing—to produce an executive office cabinet.

Accent on Excellence

Youngstown cold-rolled sheets

Inspired styling of ASE office furniture is helping create a quiet, pleasant atmosphere of efficiency, action and accomplishment for many of today's busy executives.

All-Steel Equipment Inc. of Aurora, Ill., stated in one of their recent 4-color advertisements:

"The only way a manufacturer can produce a quality product is to believe in quality. It begins with engineering that is determined to find the functional best. It is translated by materials that are beyond question the very finest. There can be no skimping. Construction must meet the blueprints' uncompromising demands."

Youngstown's Cold-Rolled Sheets have been the basic raw material for the complete ASE line of executive furniture. This quality-controlled steel provides metallurgical uniformity that makes possible trouble-free drawing and stamping—cuts costs, increases profits.

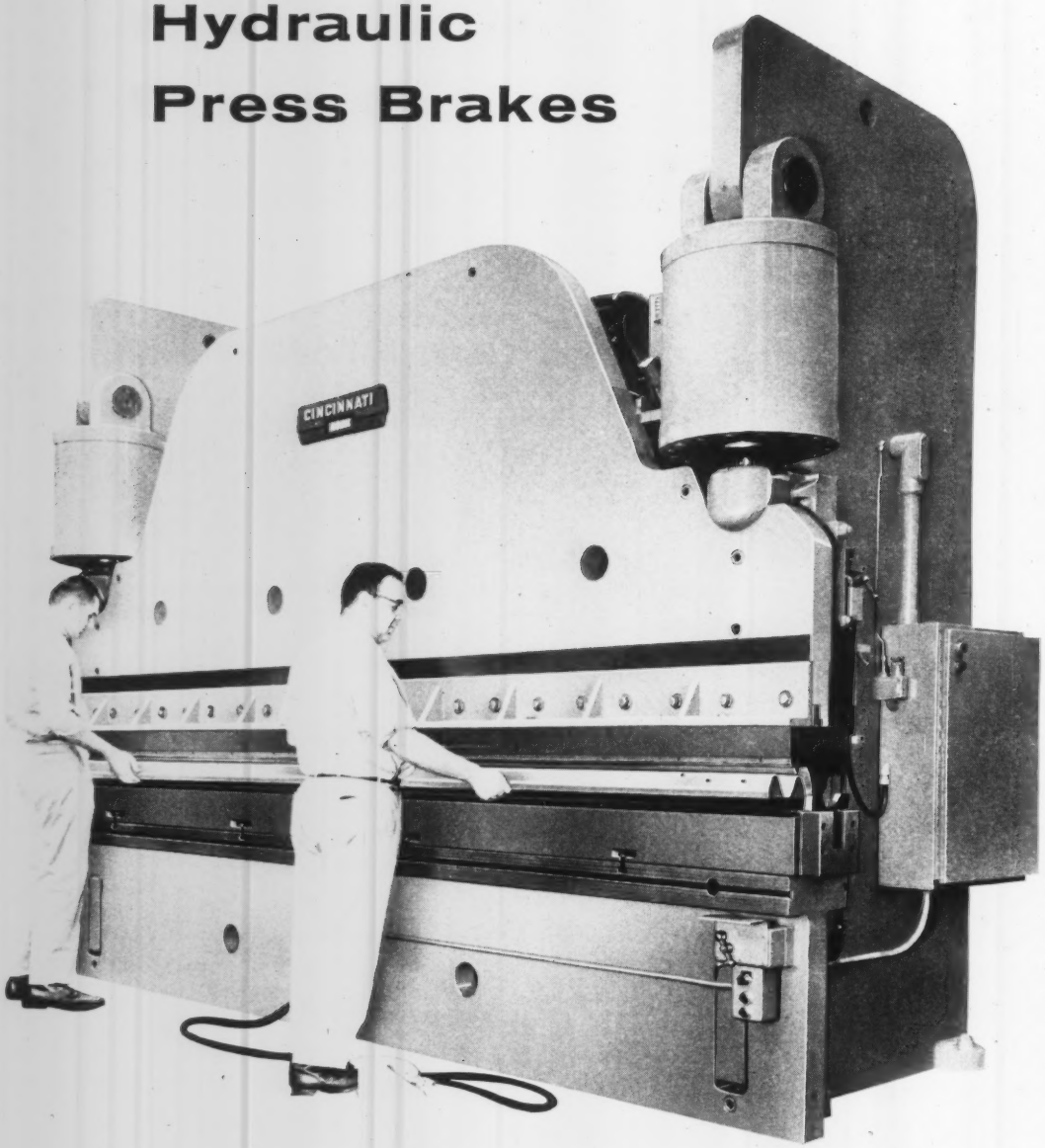
Wherever steel becomes a part of things *you* make, the high standards of Youngstown *quality*, the personal touch in Youngstown *service* will help you create products with an "accent on excellence".

QUALITY YOUNGSTOWN SERVICE

THE
YOUNGSTOWN
SHEET AND TUBE COMPANY
Youngstown, Ohio

Manufacturers of Carbon, Alloy and Yoloy Steel

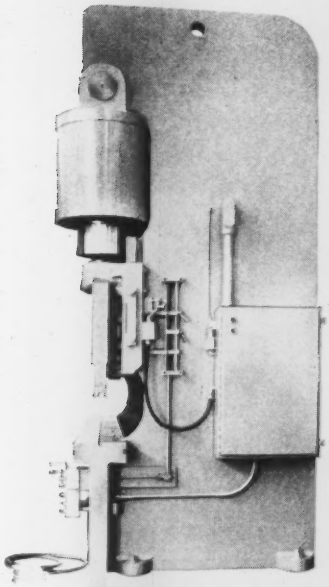
3 basic advantages of CINCINNATI® Hydraulic Press Brakes



Cincinnati® Hydraulic Press Brakes, now available in 300, 400, 500, and 600 ton capacities, are not substitutes for Cincinnati® Mechanical Press Brakes. Where high production, maximum accuracy, and greatly increased tonnage at the bottom of the stroke are required, Cincinnati Mechanical Press Brakes remain unchallenged. However, where accuracy requirements are not extremely critical, where high speed is not necessary and where long strokes are desirable, Cincinnati Hydraulic Press Brakes offer important advantages—some entirely new to the field of hydraulic press brakes.

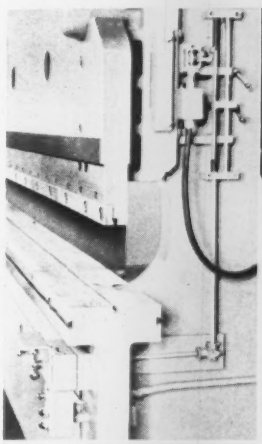
1 Accuracy

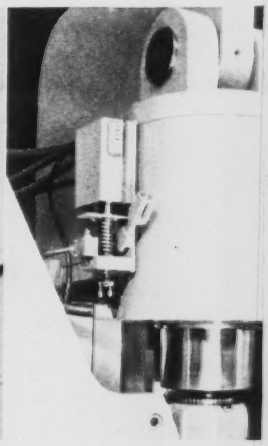
A special Cincinnati feature is extra heavy h usings which extend above the cylinders, providing means for their unique clevis mounting. This gives true enter-line loading: vertical thrust of the cylinders is arried by the housings *without welds or bolts*. The cylinders are connected to the ram with ball joints and are self-aligning in all directions. Binding of pistons and ram slides cannot occur. In addition, deep beds and rams, and large radii at all stress points minimize deflection and insure maximum accuracy. With Cincinnati interlocked construction, the bed is supported directly by the housings *without* load bearing welds.



2 Convenience

All controls are at right end of the machine within easy reach of the operator. The bottom stroke stop adjusting crank is on the front of the bed. Micrometer registers are provided to indicate both the bottom stroke-stop and ram tilt adjustments, a great convenience in setting dies on initial or repeat setups. Tonnage, stroke length, and ram position are easily set. Indicator lights tell direction ram is moving or ready to move. Machine cannot overload: it reverses when loaded to any given tonnage setting.

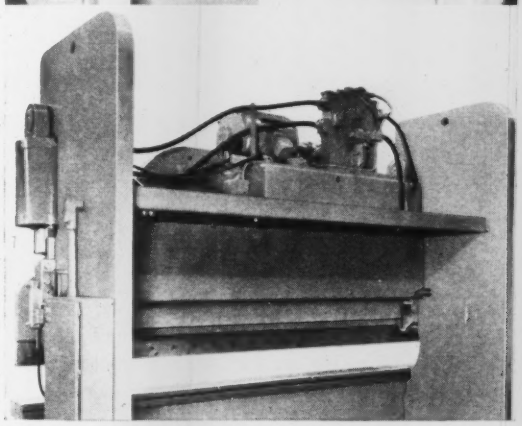




3 Economy

Greatly simplified maintenance and reduced cost result from Cincinnati's exclusive hydraulic manifold block, which brings valves and piping together in one compact assembly. The usual maze of valves, pipes and fittings is eliminated. High pressure joints are reduced to a minimum, which means important maintenance economies, year after year.

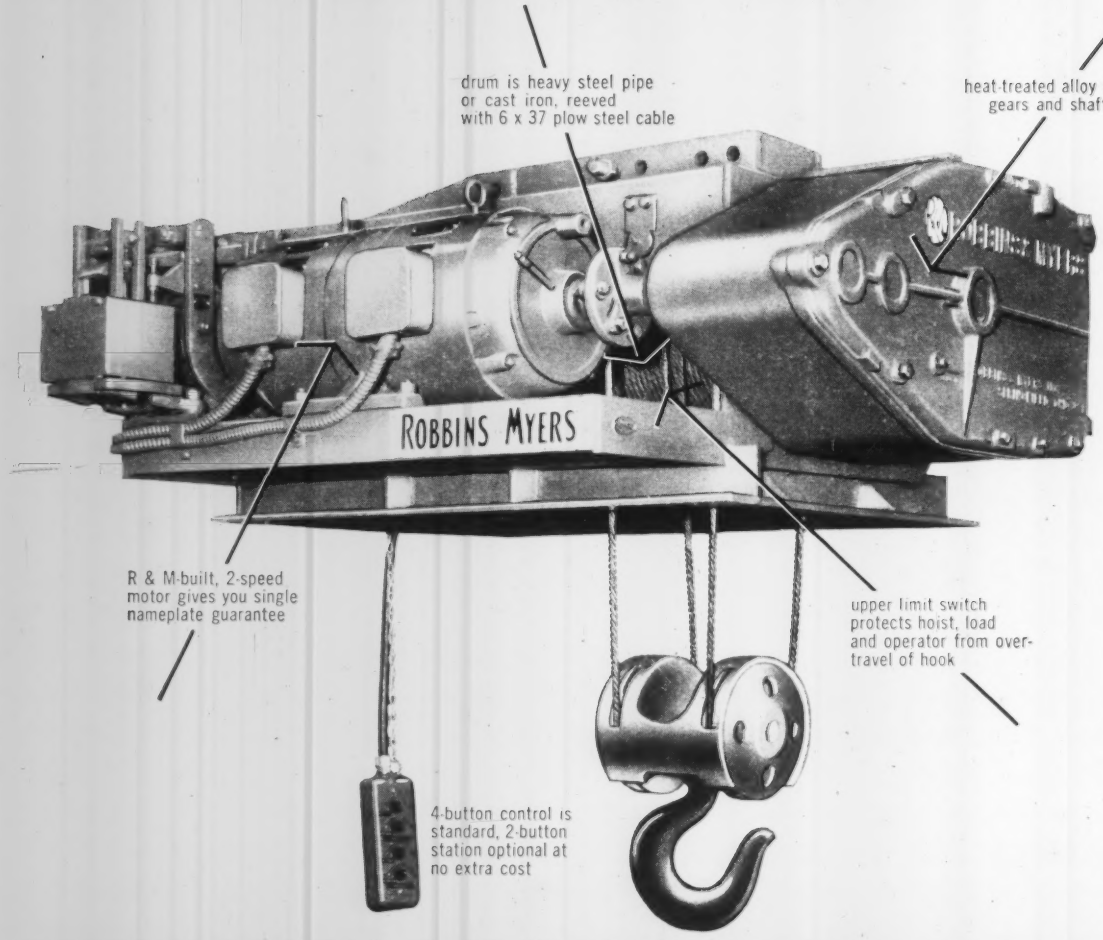
Write Dept. C for informative Bulletin [illegible]-1.



Shapers / Shears / Press Brakes

THE CINCINNATI SHAPER CO. Cincinnati 11, Ohio, U.S.A.

dual-duty hoist


drum is heavy steel pipe or cast iron, reeved with 6 x 37 plow steel cable
heat-treated alloy steel gears and shafts
ROBBINS MYERS
R & M-built, 2-speed motor gives you single nameplate guarantee
upper limit switch protects hoist, load and operator from over-travel of hook
4-button control is standard, 2-button station optional at no extra cost

R&M Dual-Duty two speed hoists keep any load under complete control. They furnish the perfect, steady speed combination you need for gentle, accurate spotting of dies, cores, patterns and other delicate loads; and they give you the fast-action lifting you want for high speed production. Their simple, dependable squirrel cage motor eliminates the uncertain speed-load characteristics and maintenance problems of the slip-ring motors used on most conventional multi-speed hoists. With R & M you can select from industry's widest job-proved line: 5 frame sizes, 25 speed-load combinations.

Capacities: ½ to 10 tons. Controls: 2 or 4 pushbutton. Mounting: lug or hook; plain, geared or motorized trolleys. *Robbins & Myers, Inc., Hoist & Crane Div., Springfield, O.*

take it up with

ROBBINS & MYERS

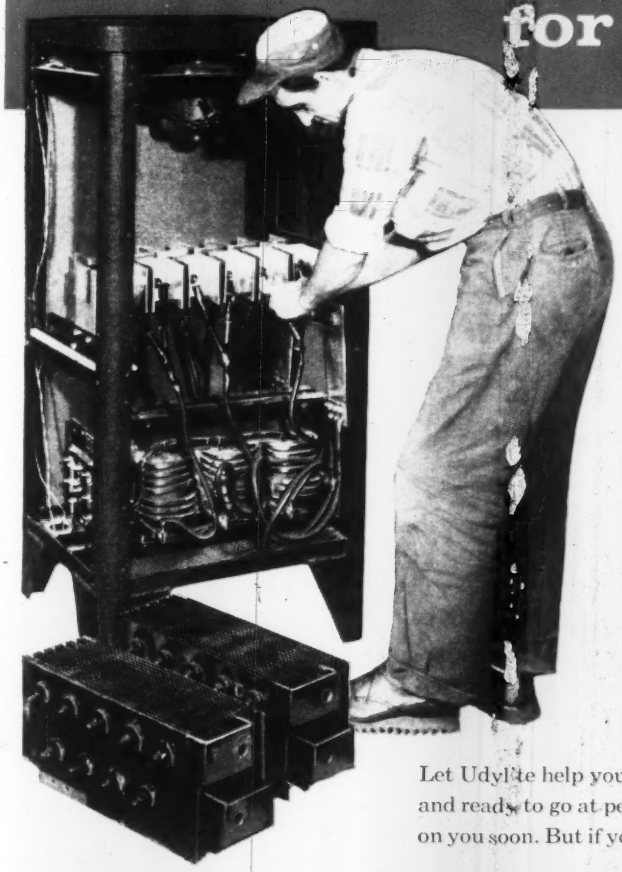
hoists **cranes**

Request Bulletin 880

Project Alert Working at UDYLITE *Produces for You...*

SILICON EFFICIENCY, RUGGEDNESS AND LONG LIFE

for old rectifiers



1. **A SPECIAL PRODUCT** . . . For the first time, a Udylite-engineered, Udylite-built *silicon* replacement stack is offered for you to use in revitalizing your Udylite magnesium-copper-sulphide or selenium rectifier and upgrading its performance to the level of today's best. *And you can do this in your own shop*, without delay, at a minimum of expense and down time.

2. **A SPECIAL SERVICE** . . . As an alternate plan, your old rectifier can be returned to Udylite for *factory* installation of the silicon replacement stacks by trained rectifier specialists. At the same time, your rectifier will be completely overhauled and tested so that it will be returned to you renewed and ready for the longer life and high efficiency of Udylite silicon.

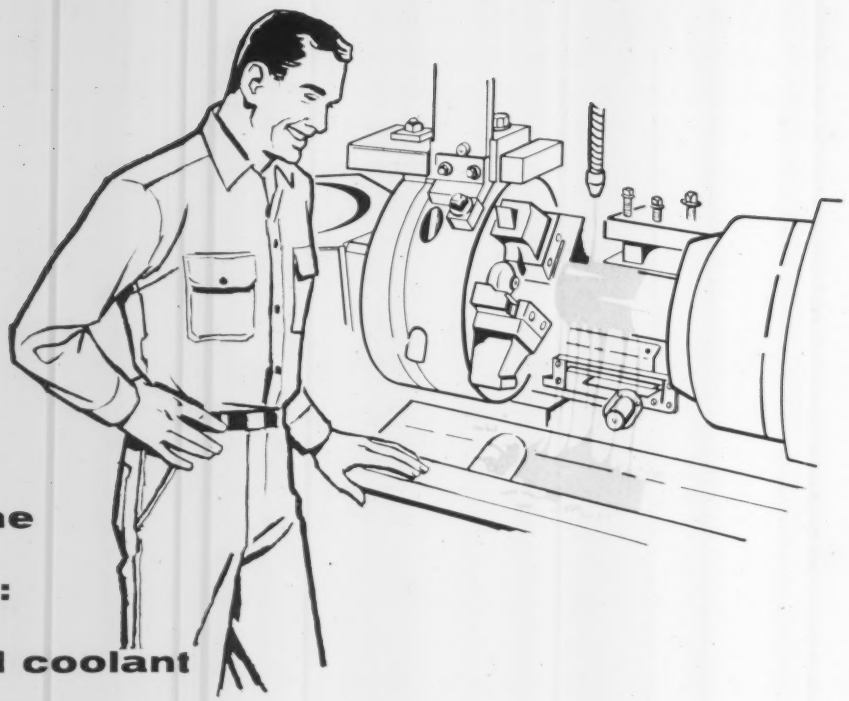
3. **A SPECIAL VALUE** . . . This whole program is set up as a Project Alert. A special department will handle your order and your equipment from start to a completely satisfactory finish. A *guaranteed delivery* will keep your down time to a minimum. With prices based on a production line plan, you will get more value per dollar spent than you ever before thought possible.

Let Udylite help you get your entire plating operation in top working order and ready to go at peak capacity. Your Udylite sales engineer will be calling on you soon. But if you need priority service, write, phone or wire directly to:

the **udylite** corporation

detroit 11, michigan • world's largest plating supplier

PROJECT ALERT



. . . And some people said: "a chemical coolant could not be a good lubricant!"

But now the lubricity of Houghton chemical coolants has amazed a lot of metalworking men. Houghton chemistry has produced a synthetic high molecular weight lubricity additive, resulting in a 100% chemical cutting base that lubricates better than most soluble oils.

Now you can have all the advantages of a chemical coolant on almost all regular machining jobs . . . fast wetting, rapid penetration, cool tools and cool work, sure protection from welding and chip buildup. The price in the machine, 6 cents per gallon, or less, depending on dilution.

You'll never need to worry about new HOCUT 237 breaking down or turning rancid. It's a true solution, not an emulsion. And it puts a two-stage rust protection on the work—thorough, over-all protection made possible by HOCUT's great wetting power. Ask the Houghton Man about this amazing new coolant today—or write E. F. Houghton & Co., 303 West Lehigh Ave., Philadelphia 33, Pa. for Product Data Sheet.

the 100% chemical cutting coolant

HOCUT

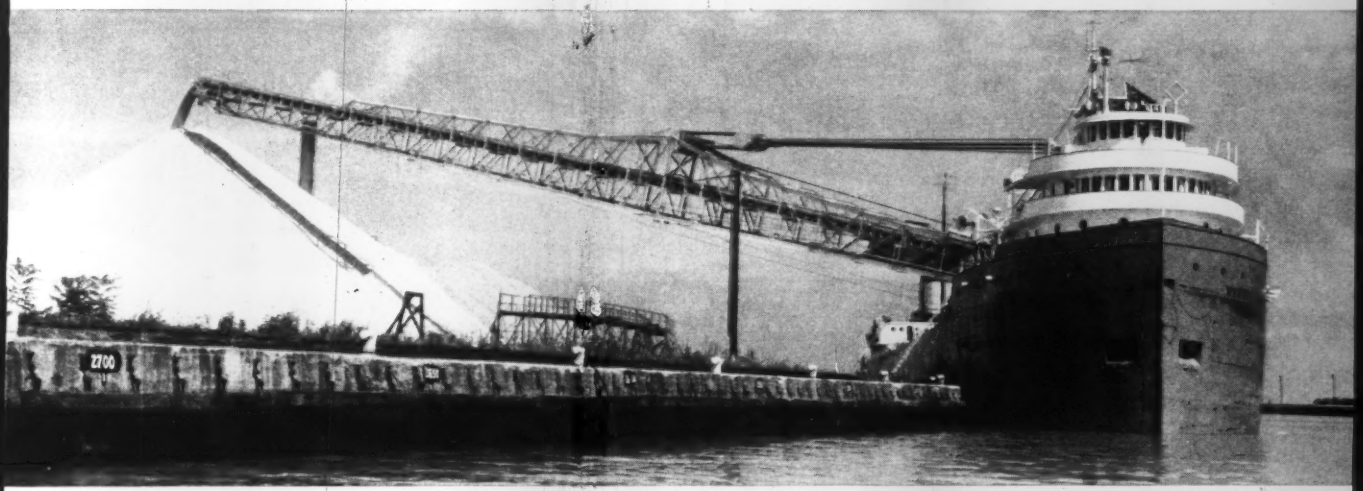
a product of . . . E. F. HOUGHTON & CO.
Philadelphia • Chicago • Detroit • San Francisco

Ready to give you on-the-job service . . .

No belt weaving

Close-up of Type II LORIG-ALIGNER Self-Centering ROLL in action under maximum load.

USS LORIG-ALIGNER Self-Centering ROLLS keep belt centered at 625 fpm while conveyor unloads 5000 tons per hour



WHEN Michigan Limestone's steamer *Myron C. Taylor* hauls into port with a cargo of 14,000 tons of limestone, even the old dock hands amble over to watch her start unloading. A 250' boom swings out from above the hold and in a few minutes the *Taylor* spews out her cargo at a rate as high as 5000 tons an hour. The limestone shoots out along the conveyor belt at 625 feet per minute —the entire load is piled on shore in record time.

Even at this speed, positive control of belt tracking is assured because the head and tail pulley positions are equipped with Type II, slit, rubber-covered, LORIG-ALIGNER Self-Centering ROLLS. These rolls, with their built-in centering action, provide accurate travel, even under adverse load conditions, and there's no fouling of the belt on the conveyor structure. Additional advantages were also gained by employing LORIG-ALIGNER ROLLS for the drive and tensioning pulleys. The slitting of the rubber covering also increases the friction between the roll and belt, thus reducing belt wear and better utilizing the drive roll energy.

If you have similiar tracking problems, the patented self-centering feature can easily be adapted to pulleys now in use. This is accomplished by the application of a rubber covering on such pulleys and slitting according to the self-centering principles. This service can be supplied by the Licensees listed below.

USS and LORIG-ALIGNER are registered trademarks

TYPE II LORIG-ALIGNER ROLL LICENSEES

AUTOMOTIVE RUBBER COMPANY, INC., Detroit 39, Michigan

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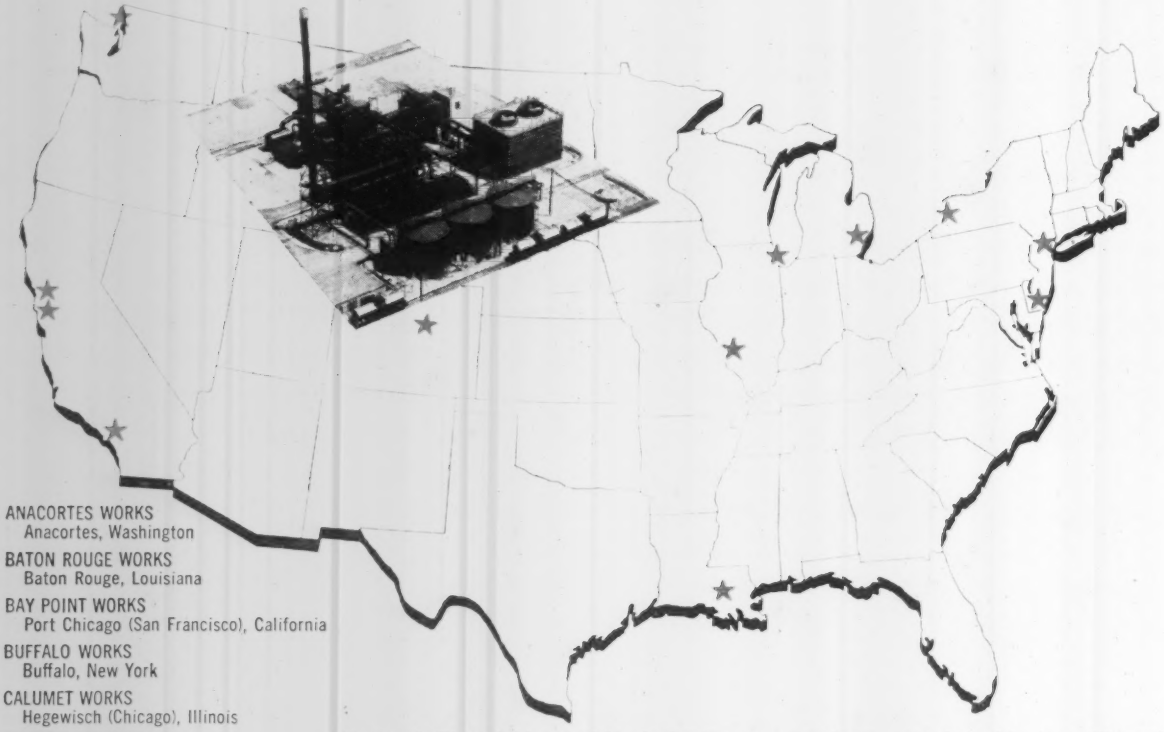
An important message ***to every sulfuric user interested in spent acid recovery...***

12 GENERAL CHEMICAL Plants

are equipped to handle spent acid for you



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General Chemical provides industry with sulfuric acid from 18 producing points, located in major centers of commerce from coast to coast. Of these, 12 are equipped to handle spent acid—providing unmatched experience, service and facilities to customers interested in spent acid recovery.

Relatively high strength, impure sulfuric presents many problems of handling and disposal. With General's help you may be able to turn this costly nuisance into an economic asset.

Whether we can help you or not depends on a number of factors: The acid strength . . . The nature and amounts of contaminants . . . The tonnage available . . . The distance of your location from our nearest plant. Generally, spent acids containing 70%-80% sulfuric acid, or higher, can be reclaimed if they do not contain impurities harmful to the equipment.

Our experience in solving spent acid problems of every kind is at your service. For further information, write or call your nearest General Chemical office.

Allied Chemical

GENERAL CHEMICAL DIVISION

40 Rector Street, New York 6, N. Y.

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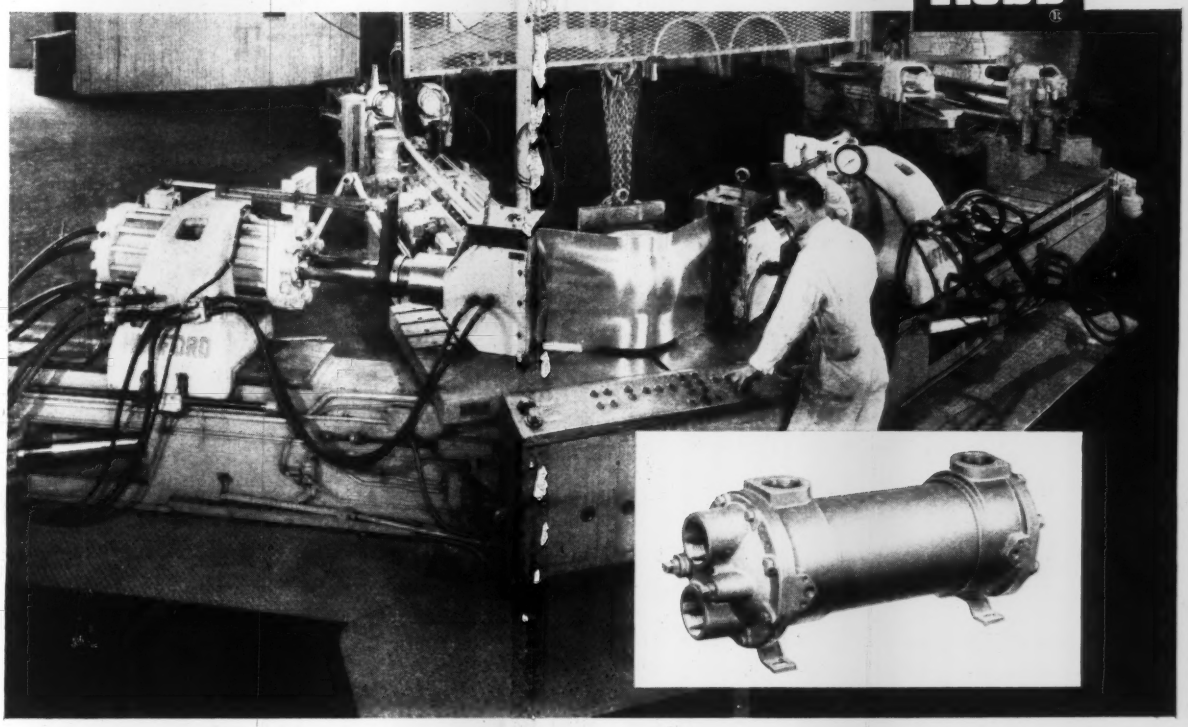
HYDRAULIC FLUID COOLING BY ROSS



Radar reflectors pulled into shape with 118,000 pound stretch

Shaping aluminum radar reflectors, this Hufford Hydraulic Stretch-Wrap Forming Machine exerts up to 118,000 pounds of pull with its powerful jaws. With the metal drawn to its yield point and wrapped around a stationary die, curvature is compounded in two directions without wrinkles.

To maintain consistent hydraulic pressures by preventing pump slippage from overheated, thinned oil, a Ross Type BCF Exchanger was installed as original equipment. Even under highest pressure, hydraulic temperature remains within desired limits. *Efficient cooling is assured.*

Says Hufford Machine Works, Inc., "Ross Exchangers are compact, easy to install and perform satisfactorily . . . We have been using them for years."

First in ruggedness and high thermal efficiency, Ross Exchangers are regularly furnished with practically every type and make of hydraulic machinery: die casters, metal drawing presses, extrusion presses, gear shapers, powdered metal presses and fluid drives.

Recently redesigned, Ross Type BCF Exchangers feature *new* flanged-lip baffles for tighter tube fit and improved thermal characteristics, *new* movable feet for easy installation, *new* materials, *new* sizes and capacities in one, two or four pass designs.

For detailed information on these pre-engineered, fully standardized units, use coupon below to request new Bulletin 1.1K6.

TO:
American-Standard
Ross Heat Exchanger Division
Buffalo 5, N. Y. S 1258

Please send, without obligation, your new Bulletin 1.1K6 describing the redesigned Ross Type BCF Heat Exchanger.

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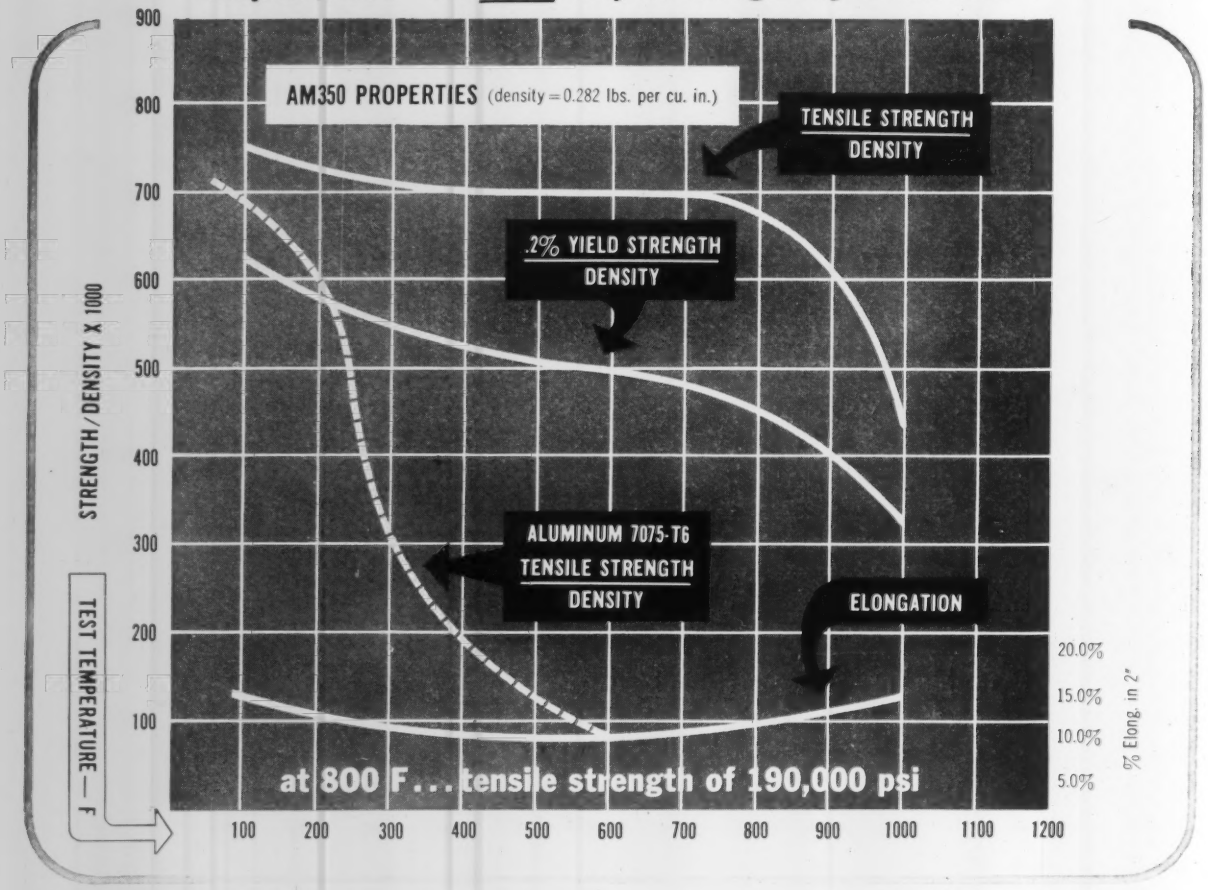
*American-Standard and Standard ® are trademarks of American Radiator & Standard Sanitary Corporation.

American-Standard PRODUCTS

AMERICAN-Standard
ROSS HEAT EXCHANGER DIVISION

Experience**—the extra alloy in **Allegheny Stainless



Here are the facts on AM350 and AM355, Allegheny Ludlum's precipitation hardening stainless steels

A unique combination of highly desirable properties is the usual description of Allegheny Stainless AM350 and AM355 Steels. They combine high strength at both room and elevated temperatures, excellent corrosion resistance, ease of fabrication, low temperature heat treatment, good resistance to stress corrosion.

They are proving the answer to many problems of the air age. Airframe and other structural parts, pressure tanks, power plant components, high pressure ducting, etc. are all natural missile and supersonic aircraft applications for AM350 and AM355.

Availability: AM350, introduced several years ago, is available commercially in sheet, strip, foil, small bars and wire. AM355, best suited for heavier sections, is available in forgings, forging billets, plate, bar and wire.

Corrosion resistant: Being stainless steels, these alloys resist corrosion and oxidation. Compared to the older, more familiar stainless grades, their corrosion rating is better than the hardenable grades (chromium martensitic) but generally less than the old corrosion resistant standbys, the 18 and 8's. Stress corrosion is resisted at much higher hardness levels than with martensitic stainless.

Simple heat treatment: High strength is developed by two methods, both involving less than ordinary temperatures and minimizing oxidation and distortion problems. The most popular, and one that develops slightly better properties, is the Allegheny Ludlum developed sub-zero cooling and tempering (SCT condition). The material is held at minus 100 F for 3 hrs plus 3 hrs at 850 F. Alternate method is Double Aged (DA): 2 hrs at 1375 F plus 2 hrs at 850 F.

Easy fabrication: AM350 and AM355 can be spun, drawn, formed, machined and welded using similar procedures as with the 18-8 stainless types. In the hardened condition (SCT & DA) some forming may be done . . . 180 degree bend over a 3T radius pin. Also it can be dimpled in the hard condition to insure accurate fit-up.

For further information, see your A-L sales engineer or write for the booklet "Engineering Properties, AM350 and AM355." *Allegheny Ludlum Steel Corporation, Oliver Building, Pittsburgh 22, Pa.* Address Dept. S-12.

WSW 7327

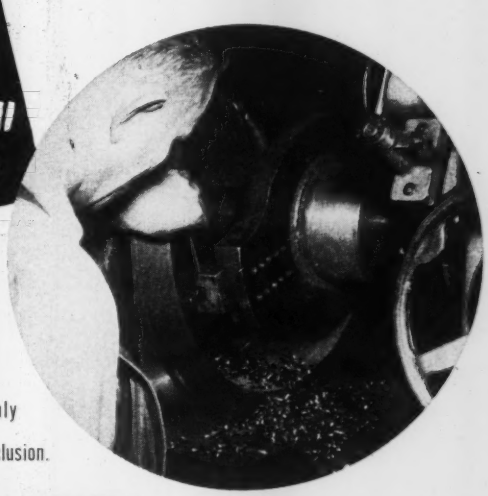
ALLEGHENY LUDLUM

Export distribution: AIRCO INTERNATIONAL

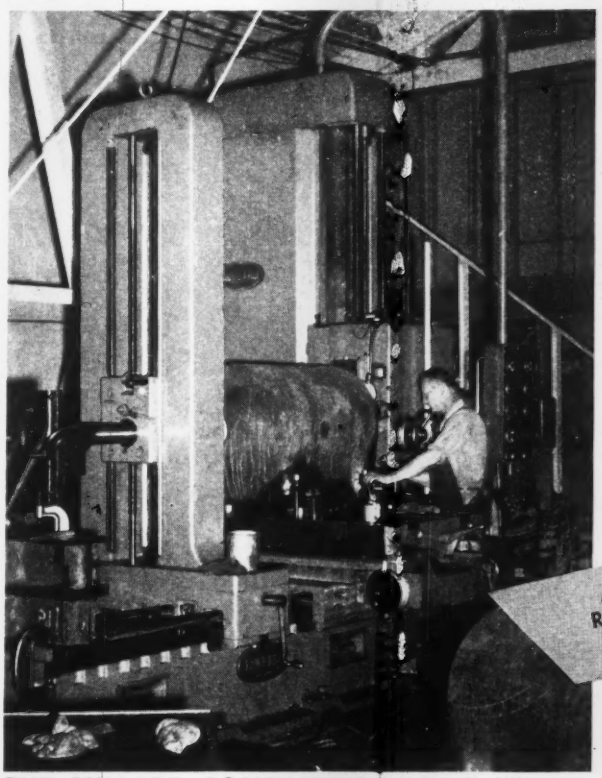
EVERY FORM OF STAINLESS . . . EVERY HELP IN USING IT

"To meet Today's and Tomorrow's Complex Machining Problems

"we bought a . . . BULLARD H.B.M. model 75"



This statement by Mr. Reed [illegible]ark, General Manager, C. & H. Machine and Engineering Company, Berkeley, California summarizes, after thoroughly investigating and comparing competitive machines, their conclusion.



If you are planning to purchase a horizontal boring machine, we invite you to compare, feature for feature, the Bullard H.B.M., Model 75 with other machines in its field. You will discover that — "To Cut Costs When Cutting Metal — Buy Bullard" — is sound advice.

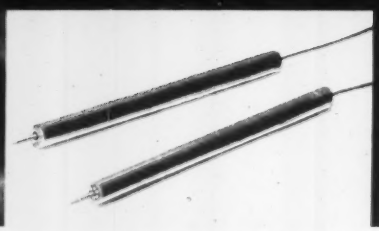
A call to your Bullard Sales Representative or Distributor will bring you the complete story.

BULLARD

THE BULLARD COMPANY 286 Canfield Ave. Bridgeport 9, Connecticut

spotlighting

A TREMENDOUS TRIFLE



Previous contact tube design depended entirely on wire cast for limited contact; uncertain current pickup resulted. New-Longitudinal wires, brazed at one end, act as a chuck to insure positive contact.

...that dramatically improves the arc stability of your Aircomatic® equipment

Physically, this new contact tube with "floating Chuck" is just a trifle—a simple set of hardfaced "wiping" wires** inserted in the contact tube barrel of your Aircomatic gun. But it gives positive, multiple contact with the welding wire at all times.

It ends interior arcing, prevents burnback, galling, insures good current pickup, increased current capacity and stable arc performance—on Aircomatic welding guns.

The new wiping action contact tube is available in various diameters for the Aircomatic MIGet*, the Aircomatic Pull gun, the Aircomatic push gun (except heavy-duty), and the AMHB Aircomatic head. Also supplied as standard equipment on all new guns. For complete information, contact your Airco office.

Welding wire leaves the barrel through a nest of longitudinal wires. Wiping action assures stable arc performance even with aluminum and magnesium wires.

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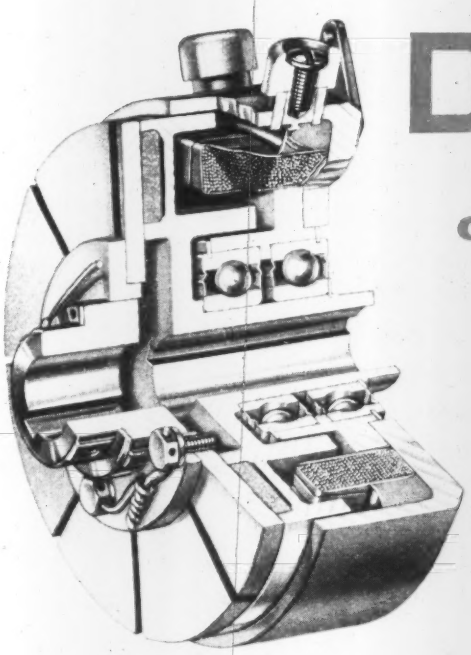
EATON DYNA-TORQ

MAGNETIC-FRICTION CLUTCHES and BRAKES

Now Available in a Full Line from 1¾" to 15" Diameter



STATIONARY-FIELD, BEARING-MOUNTED DYNA-TORQ CLUTCH

Eaton Dyna-torQ Magnetic-Friction Clutches and Brakes provide a simple, accurate, responsive method of controlling power and motion in today's complex production and processing machines.

The new smaller sizes and new design types of Dyna-torQ Stationary-Field Clutches and Brakes enable Eaton to offer a well rounded line, including flange-mounted and bearing-mounted clutches, and replaceable-face brakes. Unique features of design and construction result in worthwhile maintenance cost savings. Dyna-torQ units, easily and quickly installed on new machines or existing plant equipment, deliver many highly desirable advantages.

Dyna-torQ Magnetic-Friction Equipment Offers these Important Advantages:

- ★ Accurate power control
- ★ Dependable motion control
- ★ Rapid response
- ★ Easy "built-in" installation
- ★ Low maintenance costs
- ★ Compact plug-in type controls—may be remotely mounted
- ★ Inter-changeability of parts

Send for this new illustrated bulletin giving complete description and specifications covering Dyna-torQ Stationary-Field Clutches and Replaceable-Face Brakes.

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Dyna-torQ Equipment is Available through Dynamatic Distributors in all Leading Cities

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DYNAMATIC DIVISION
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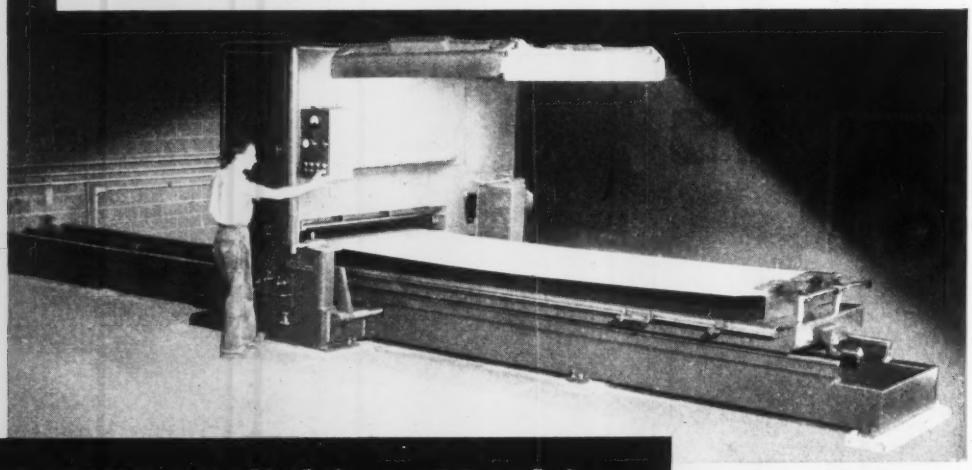
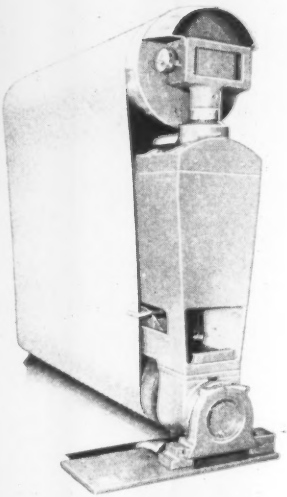
3307 FOURTEENTH AVENUE • KENOSHA, WISCONSIN

HILL Sheet and Plate polishing machine with reciprocating hydraulic table and vertical two roll head.



A HILL Polishing Machine of *YOUR OWN* will afford you important savings . . .

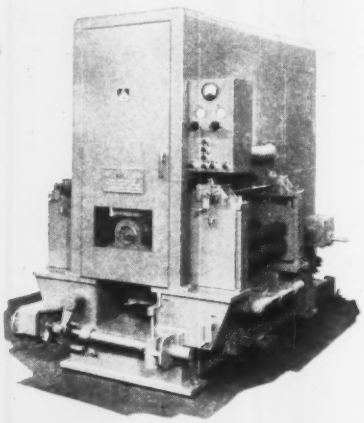
- *By eliminating mill extras.*
- *By proper finishing and prepolishing before forming.*
- *By enabling you to prepare the correct surface finish to meet each individual job need.*



IT'S MOSTLY IN THE HEAD

Two rolls accurately controlled for speeds and pressures with easy adjustment for proper tension of the endless abrasive belt. For fine finishing of all types of ferrous and non-ferrous metals.

● HILL polishing machines are now saving important percentages for manufacturers supplying the dairy and sanitation fields, for automobile bumpers, engravers plates and a wide variety of other industries.



HILL Pinch Roll type with vertical two roll head for polishing strip. Can be used singly or in multiple units for line production.

HILL ACME TOOLS FOR INDUSTRY

The HILL ACME Company

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"HILL" GRINDING & POLISHING MACHINES • HYDRAULIC SURFACE GRINDERS • ALSO MANUFACTURERS OF "ACME" FORGING THREADING • TAPPING MACHINES • "CANTON" ALLIGATOR SHEARS • BILLET SHEARS • "CLEVELAND" KNIVES • SHEAR BLADES

* **Stainless Steel spinning information:**

*Before you take a spin—check the oil

Stainless Steels lend themselves readily to cold spinning. When you spin Stainless Steel, be especially generous with the lubricant. Use lubricants with sufficient body to withstand the high pressures and temperatures that may develop. Because of Stainless Steel's superior toughness, greater pressure is required than that used for carbon steel. A good spinning tool is made of hardened alloy steel. It should have a large bearing surface to distribute the pressure as widely as possible.

Spinning Stainless Steel will give you accurate and uniform wall thickness in one operation not readily obtainable in drawing. Certain shapes can be spun more economically than drawn, which may require several operations and heat treatment. Remember, too, that certain types of steel are more adaptable to spinning than drawing.

You'll find that Stainless Steel isn't difficult to spin, it's just different. You can do a top-notch job with ease when you follow our 130-page manual. If you haven't received your free copy, write on your company letterhead for our "Stainless Steel Fabrication Book," United States Steel, 525 William Penn Place, Pittsburgh 30, Pa.

USS Stainless Steel is available through your USS representative or your local steel service center.

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USS **United States Steel**

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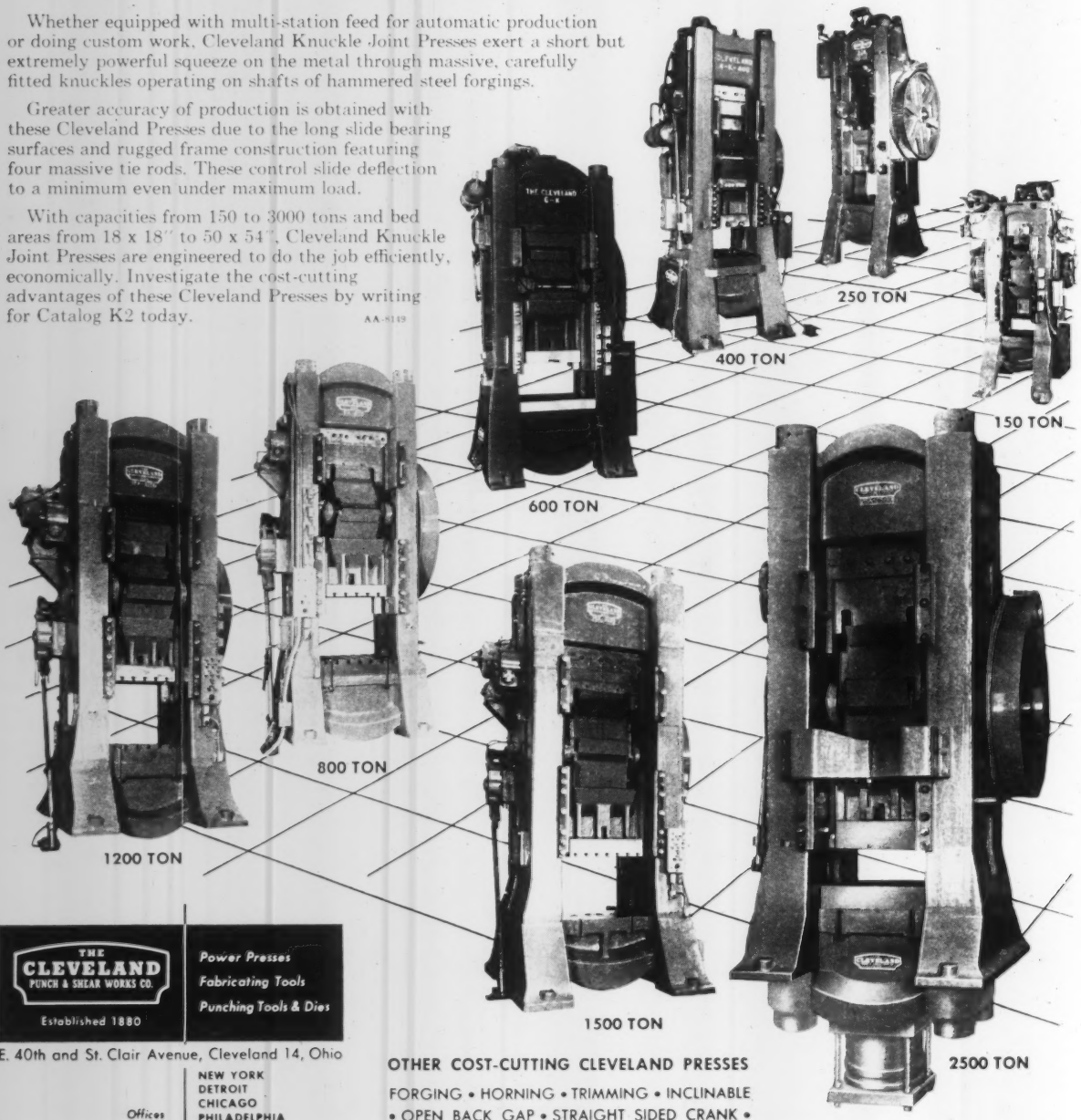
FOR AUTOMATIC FEEDS OR CUSTOM WORK

Whether equipped with multi-station feed for automatic production or doing custom work, Cleveland Knuckle Joint Presses exert a short but extremely powerful squeeze on the metal through massive, carefully fitted knuckles operating on shafts of hammered steel forgings.

Greater accuracy of production is obtained with these Cleveland Presses due to the long slide bearing surfaces and rugged frame construction featuring four massive tie rods. These control slide deflection to a minimum even under maximum load.

With capacities from 150 to 3000 tons and bed areas from 18 x 18″ to 50 x 54″, Cleveland Knuckle Joint Presses are engineered to do the job efficiently, economically. Investigate the cost-cutting advantages of these Cleveland Presses by writing for Catalog K2 today.

AA-5139



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Established 1880

Power Presses
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Advantages for You

IT ALL COMES DOWN to one fact...that you can always count on Roebling high carbon flat spring steel to reduce preparation time, machine stoppages and rejects to a minimum. What's more, it's made as you want it... annealed, hard rolled untempered, scaleless tempered, tempered and polished, blued or strawed.

You pay for the best every time you buy flat spring steel. Make sure you *get* it. Specify Roebling. Write Wire and Cold Rolled Steel Products Division, John A. Roebling's Sons Corporation, Trenton 2, New Jersey.

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A few of the thousands of high-quality items made from superior Roebling cold rolled steel.

Roebling... Your Product is Better for it

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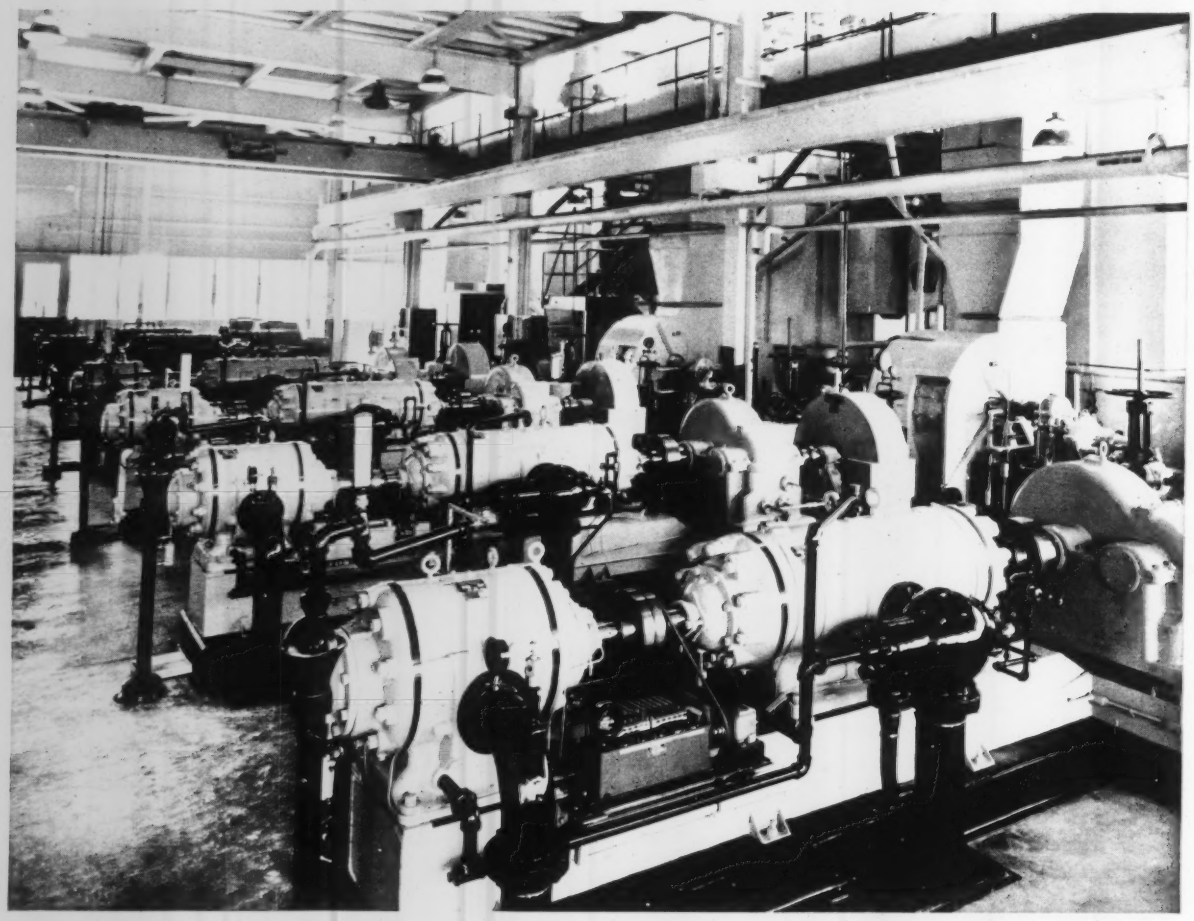

4 YEARS - - 25,000 HOURS OPERATING PERFORMANCE!

This is just one of many production records set by Fuller Rotary Compressors — in this case by each of six machines installed in a leading aircraft plant. The only maintenance or replacement necessary over this period was installation of high and low pressure blades. Bearings held up 100%.

Fuller rotary compressors shown are four C-300-300H, steam turbine drive, capacity each 1248 to 1805 c.f.m., with speed ranges of 450 to 650 r.p.m., 125-lb. gauge pressure, and two electric motor drive, capacity each 1663 c.f.m., at 600 r.p.m., 110 lb. gauge pressure.

Your plant, too, can take advantage of the many cost-saving advantages of Fuller rotary compressors; such as smooth airflow, lack of vibration minimum of moving parts, adaptability to any production setup, and the advantage of "one man" operation.

Write today to Fuller Company and get complete data on how Fuller rotary compressors can give you more air power at less cost.

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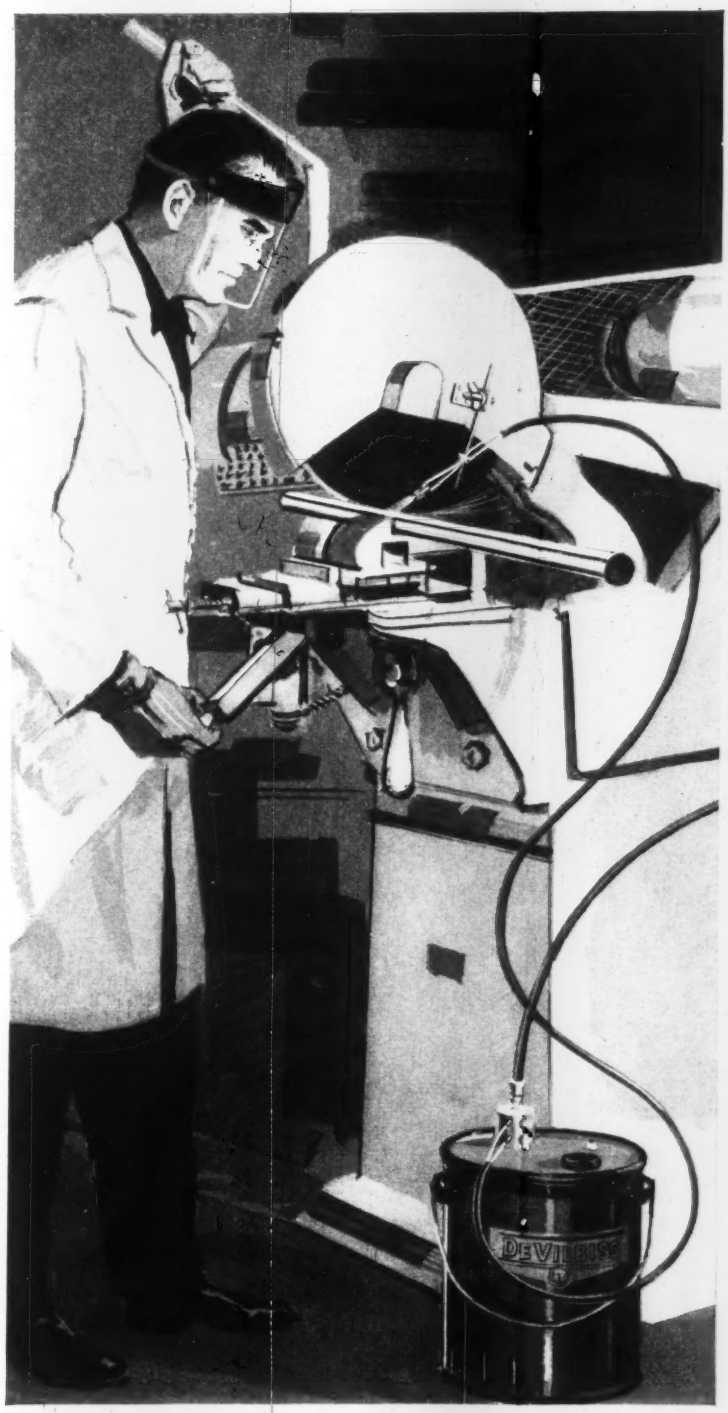
MULTI-MISTER INCREASES CUT-OFF WHEEL LIFE 40%



TEST:

Conducted by A. P. deSanno & Son, Inc., Phoenixville, Pennsylvania, on RADIAC type "C" machine, equipped with a $7\frac{1}{2}$-hp, 3600 rpm motor, operating a wheel spindle at 5000 rpm. Two resinoid-bonded abrasive cutting-off wheels—each $11\frac{9}{16}$" in diameter and approximately .097" thick—were used to make 18 cuts apiece through a 1" cold-rolled steel bar. One wheel was used dry, the other was cooled by a DeVilbiss Multi-Mister.

RESULTS:

The 18 cuts wore the diameter of the dry wheel $\frac{7}{16}$".The wheel spray-cooled by Multi-Mister wore only $\frac{5}{16}$"—a $\frac{1}{8}$" difference in wear, or 40% greater wheel life.

A DeVilbiss Multi-Mister can also increase the life of your forming and cutting tools. Multi-Mister directs a chilling blast of air and coolant to keep temperatures down two ways: (1) the jet of expanding air dissipates tool heat instantly, and (2) the mist lubricates cutting edges to reduce friction. Complete outfits start at $40; attach quickly and easily to any machine.

So call your DeVilbiss representative today for all the facts on mist cooling, plus a free demonstration of Multi-Mister on your own machines. Or write for Bulletin BC 1025.

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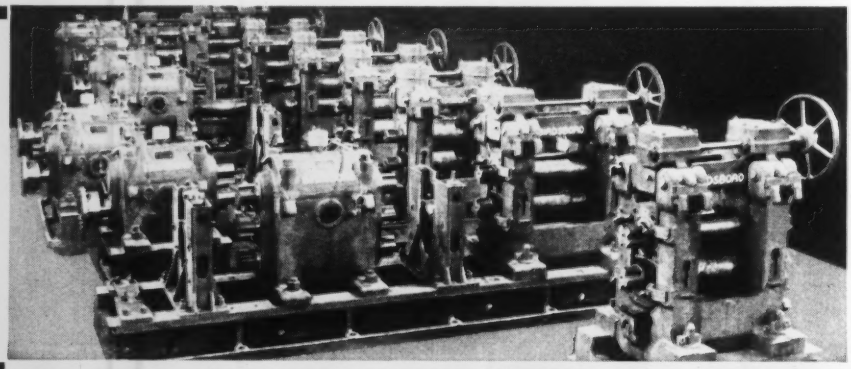
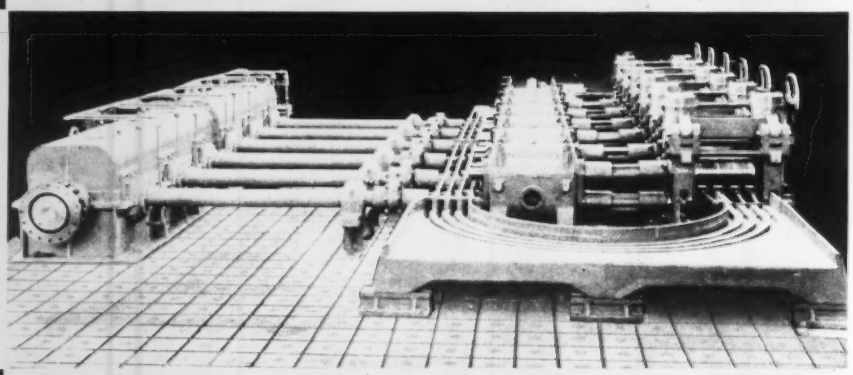
Put Your Steel Production **Ideas** Into Action Through **BIRDSBORO**

Right now, you have ideas on how production from your mill can be increased, quality improved or savings made. This may be the time to think about putting them to work. When you do, call in BIRDSBORO, specialists in *customized* mill machinery. Direct our large and varied facilities toward *your* goals. Take advantage of production experience that has included many of the most important advancements in the industry. The first step . . . contact your BIRDSBORO representative.

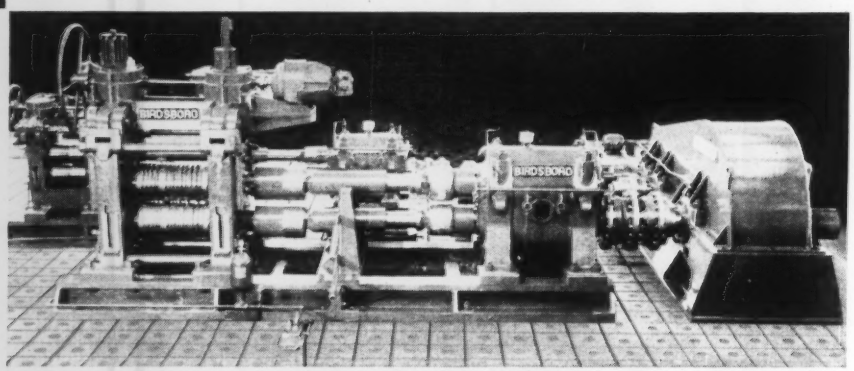
Roll Stands and Pinion Stands for 10'' Rod Mill



12''—6 Stand Continuous Rod Mill and Drive



16''—10'' Bar Mill



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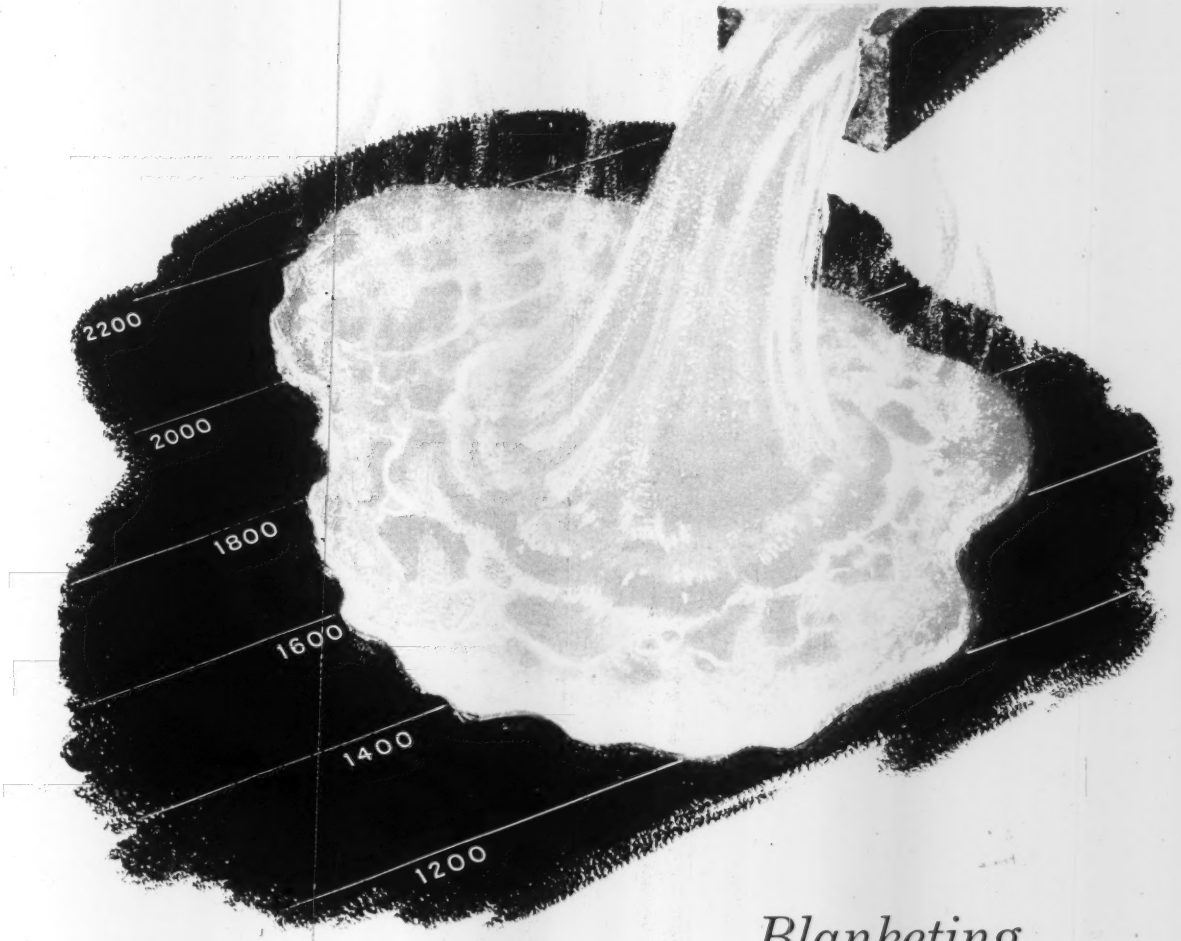
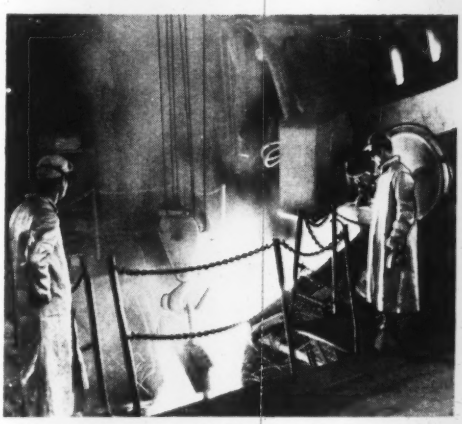


Blanketing the high temperature field



Close control is exercised over every step in the production of HAYNES alloys. This electric arc furnace is part of the modern mill set-up maintained at HAYNES STELLITE.

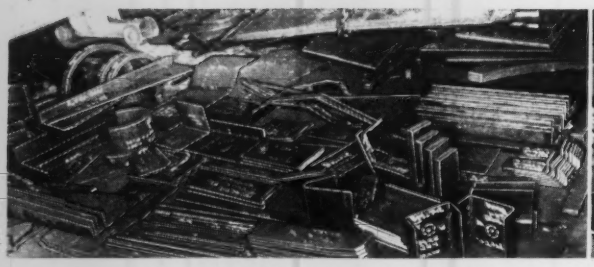
A fairly ambitious claim! Yet we can prove that HAYNES alloys do exactly that . . . all the way up to 2000+ deg. F. Here's why. There are 12 HAYNES high-temperature alloys. Among them you will find the right combination of properties to handle any heat condition. For example, HASTELLOY alloy X has remarkable resistance to oxidation up to 2200 deg. F. HAYNES alloy No. 25 is strong and resists stresses, oxidation, and carburization up to 2000 deg. F. HASTELLOY alloy R-235 is outstanding in the 1500 to 1750 deg. F. range. And this is only part of the story. All 12 HAYNES alloys are *production* alloys and are readily available. Some of them are vacuum melted; some air melted. Some are cast, some wrought, and some are produced in both forms. For the full story, write for literature.

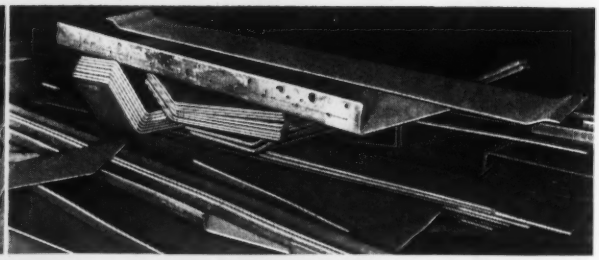
HAYNES
ALLOYS

HAYNES STELLITE COMPANY
Division of Union Carbide Corporation
Kokomo, Indiana

UNION CARBIDE

The terms "Haynes," "Hastelloy," and "Union Carbide" are registered trade-marks of Union Carbide Corporation.

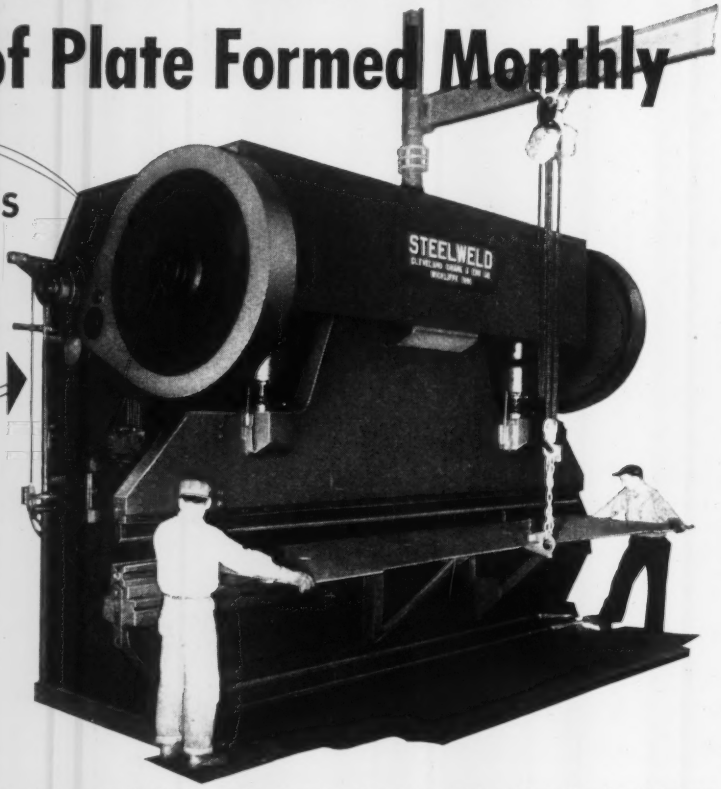




Some of the thousands of varied parts formed on the Steelweld Press. These involve bends and curves of every description in many plate thicknesses. Bars of heavy cross-section, usually requiring a bulldozer, are formed into semi-circles for gear rims and similar uses.

800 Tons of Plate Formed Monthly

STEELWELD PRESS *Produces* Infinite Variety of Curves and Bends



This Steelweld Press is rated at 1½"x14'0" mild steel. With the 24-inch bed and ram extension at each end, it will bend plate that can clear by the 18-inch deep throat to 18'6" long. Two cross shafts with foot pedals are provided for operating the press. The lower shaft is for normal operation while the upper shaft brings the reversing flywheel into action to back the ram off the work whenever desired.

EVERY month some 800 tons of plate of all thicknesses to one-half inch is formed with bends and curves of every description on a Steelweld Press. The machine is in operation nine hours a day.

Since parts formed are produced in very small duplicate quantities, the dies and machine settings usually must be changed many times during a day. Because of the ease with which Steelweld Presses can be set up, the operators can do this quickly and easily.

Steelweld Presses offer so many advantages that we urge you to write for the catalog below and get all the facts on them. Hundreds of these machines are now in use for bending, forming and punching operations of every description.

GET THIS BOOK!

CATALOG No. 2010 gives construction and engineering details. Profusely illustrated.

THE CLEVELAND CRANE & ENGINEERING CO.
7351 EAST 281st ST. WICKLIFFE, OHIO

STEELWELD

PRESS BRAKES

BRAKING • FORMING • BLANKING • DRAWING • CORRUGATING • PUNCHING

NEW JESSOP STEEL PLATE

offers exceptional resistance to wear

New Jessop TRU-WEAR-FM solid or clad plate is rolled from a special analysis steel designed for exceptional resistance to abrasive wear. When compared with other steels in this category, it offers less distortion during heat treatment, and up to 10 times the wear resistance with equal impact strength. Fabricators of chutes, mold boxes, special cutters and other applicable equipment should take note.

For additional information, write or call Jessop Steel Company at Washington, Pa. or any of the addresses shown below.

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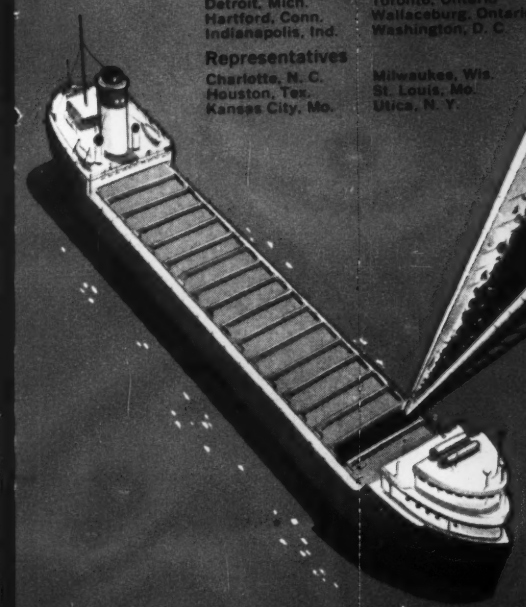

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STEEL COMPANY · WASHINGTON, PA.

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Wholly-owned Subsidiaries: Jessop Steel of Canada Limited, Wallaceburg, Toronto
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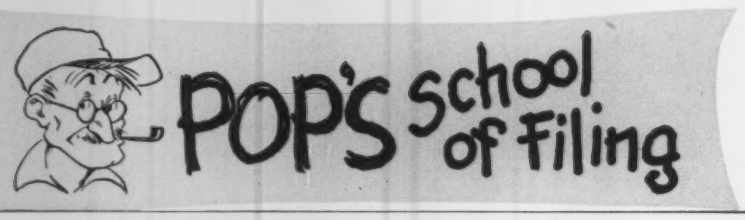
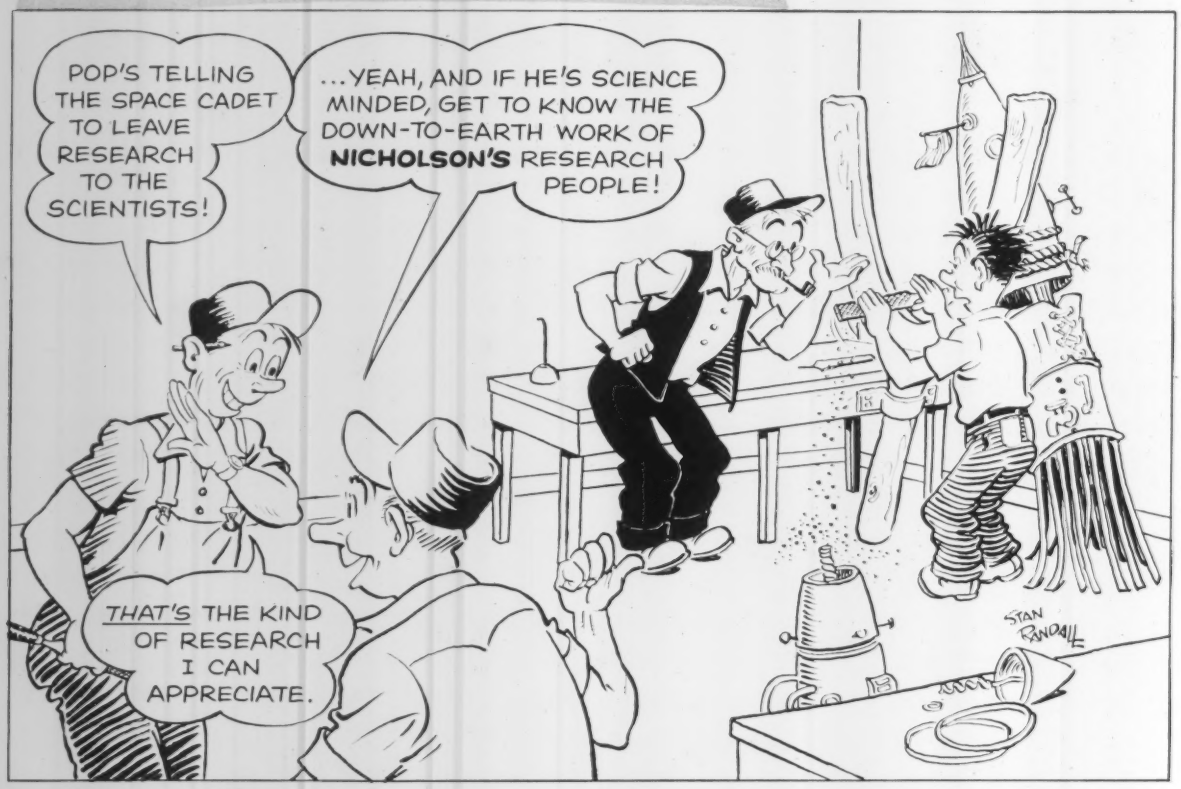
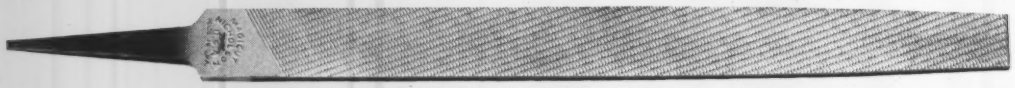



POP'S TELLING THE SPACE CADET TO LEAVE RESEARCH TO THE SCIENTISTS!
...YEAH, AND IF HE'S SCIENCE MINDED, GET TO KNOW THE DOWN-TO-EARTH WORK OF NICHOLSON'S RESEARCH PEOPLE!
THAT'S THE KIND OF RESEARCH I CAN APPRECIATE.
STAN RANDALL



NICHOLSON RESEARCH SEEKS WAYS TO HELP YOU

Research has always been a part of our business—an important part.

From the time the first Nicholson file was made, we have had a research department which has constantly looked for and found ways to improve file design and manufacturing methods.

Today research is one of the most important parts of our engineering department. Our search for still further improvements goes on. Recently, this work led to the "Magicut," an All-Purpose Machinist's file (illustrated above) with a new type of tooth construction. This new file now cuts filing costs wherever many companies file metal.

In addition to new products, there's another service for you in our research department. When you have a filing problem, our research staff will gladly work out an answer. We have the facilities and the technical people to find the answer. If you'd like help with a filing problem, let your Nicholson or Black Diamond distributor know. We'll get you the answer quickly.

Industrial Distributors provide the finest goods and services in the least possible time. Our files are sold exclusively through them.

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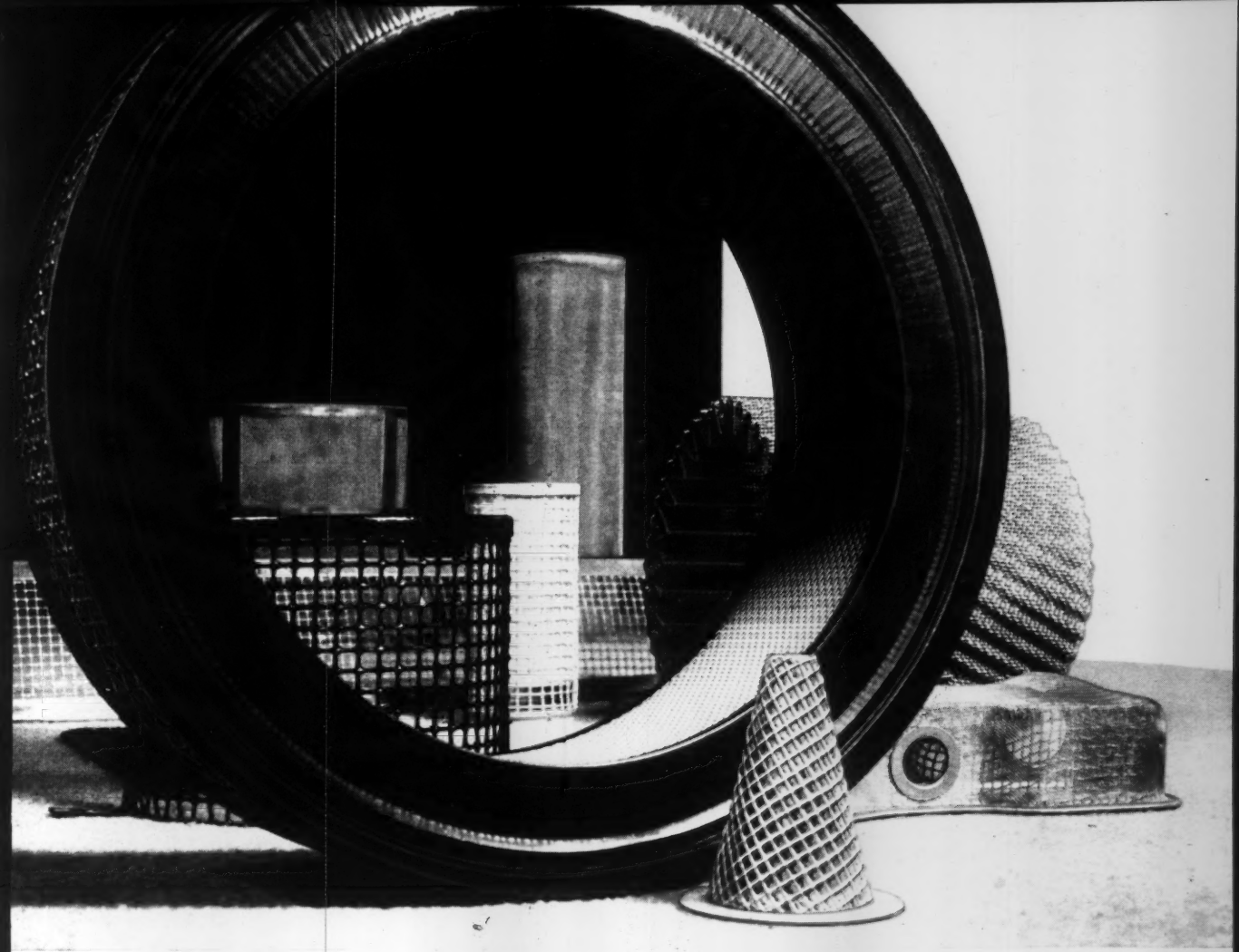
NICHOLSON and BLACK DIAMOND FILES

A FILE FOR EVERY PURPOSE



How to **USE** wire cloth at lower cost

Today many companies are able to make wire cloth components, like these shown here, at lower cost than ever. The answer lies in new services, new developments worked out by the *Reynolds Wire Division* of National-Standard . . . ideas aimed at the more effective, less wasteful *use* of industrial wire cloth. For example . . .

5 SUGGESTIONS:

1. Check on wire cloth rolls 2 to 8 times normal length . . . for 2 to 8 times as much production in a single run. Fewer shutdowns. Less handling.

2. Consider pre-slit widths, plain or with woven-in reinforcement, as narrow as 1 inch or less, to meet your requirements exactly with minimum handling and waste.

3. Evaluate Reynolds' new palletized packaging. Less chance of damage. Faster, easier handling on arrival, in and out of storage and right to production operations.

4. Look into the many different weaves, meshes, metals, finishes and coatings . . . some unique with Reynolds . . . to make sure of the optimum specification for your requirement.

5. By all means take advantage of Reynolds' engineering and analytical service . . . nation-wide and unmatched in the industry. Time and time again it contributes to a better finished product at lower cost.

NATIONAL NS NATIONAL-STANDARD Company **STANDARD**

DIVISIONS: NATIONAL-STANDARD, Niles, Mich.; *fine wire, stainless, music spring and plated wires* • WORCESTER WIRE WORKS, Worcester, Mass.; *music spring, stainless and plated wires, high and low carbon specialties*
WAGNER LITHO MACHINERY, Secaucus, N. J.; *metal decorating equipment* • ATHERTON STEEL, Clifton, N. J.; *flat, high carbon spring steels* • REYNOLDS WIRE, Dixon, Ill.; *industrial wire cloth*

Jungle missionary straightens out shaft problem

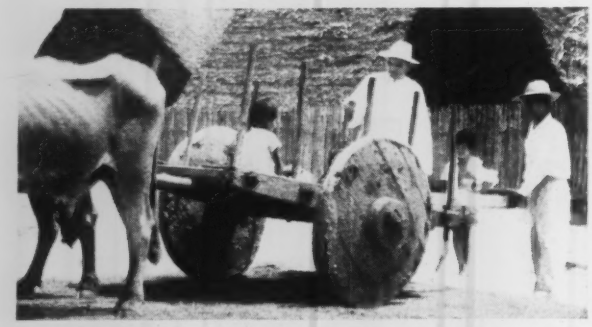
Hazardous passage. Drifting debris, submerged rocks and ever-shifting shoals pose constant threats to this missionary. He is Brother Dismas of the Maryknoll Fathers, whose frequent missions take him up and down uncharted, unpredictable waters deep in the jungles of Bolivia.

There's no telling what he may run into here. One of the menaces is the dead *Tajibu* or "vegetable iron" tree.

A giant hardwood, the *Tajibu* dies and topples into the river. The wood is so heavy the whole tree sinks. And so *hard* it's been used in place of bearing metal. Imagine what happens when a *Tajibu*, cartwheeling along in the swiftly running current, tangles with the boat's slender drive shaft . . ! It's virtually impossible to detect one fast enough to avoid being rammed.

Man-eating Piranhas and alligators lurk in these jungle rivers, but Brother Dismas dives in and removes bronze propeller shaft, bent in collision with an unseen *Tajibu*. With nearest help several days' journey away, he has no alternative but to attempt an on-the-spot repair.

Riverside "shop" The bent bronze shaft is first heated over an open fire, then placed on a log and hammered straight. This primitive repair job has to get him back to his base. "After a few experiences like this, I got a bright idea," says Brother Dismas. "I decided to try one of your Monel shafts.



"Monel shaft arrives . . . and was I glad to see it. I've found that bronze shafts bend too easily in these rivers and steel shafts corrode and chew up bearings. We picked up our new Monel shaft in an ox cart at the airport and were underway with it in record time. Now we have . . .

"A sturdy shaft — at last!" Monel* nickel-copper alloy or another Inco Nickel Alloy may carry you, too, safely through the hazardous waters of metal selection. Let our booklet *Standard Alloys for Special Problems* point the channel. The International Nickel Company, Inc., 67 Wall Street, New York 5, N. Y.

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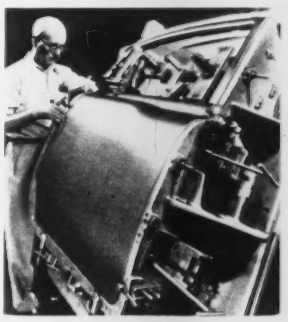
INCO NICKEL ALLOYS

NICKEL ALLOYS PERFORM BETTER LONGER

Metalworkers To Win 4% More Defensework

Getting your share of defense business? Metalworking should win 4 per cent more government work in 1959 than in 1958, say managers queried by STEEL (Page 63). Total defense volume will probably hit about $52 billion in fiscal 1960, 2.4 per cent more than the estimated $41 billion in fiscal 1959. Despite the potentials, less than half of all metalworking companies supply the Pentagon. One reason for lack of enthusiasm is renegotiation. Congress last year extended the Renegotiation Act only six months so it would have time to study the situation. But observers tell us (Page 64) that chances for extensive reform next year are slim.

Detroit Tool and Die Shops Fight for Their Lives



Take the case of the Detroit tool and die job shops. They're caught in a paradoxical squeeze which you'll want to stay miles away from. The heyday of the independent in autodom's capital is over because of the Big Three's decentralization and competition from captive and foreign shops. Carmakers once paid independent craftsmen premium rates because of their ability to solve production problems. High wages for the tool and die jobber in Detroit were accepted. Lately, however, auto companies have been switching emphasis, paring production expenses and giving marketing people a freer hand. Result: Independents found themselves with wage rates 45 cents an hour above scales of workers in captive shops in the same city. Detroit job shop wages average 60 cents an hour higher than those in Toledo, Ohio, $1.10 more than in Nashville, Tenn. (Page 81). What to do? Detroit shops aren't finding the answer easy. They're moving to lower wage areas; they're looking for customers in other fields who need their skills; they're occasionally merging; about two a week have been going out of business.

Coal Operators To Absorb Most of Wage Hike

Look for the soft coal operators to absorb most of the $2-a-day increase in wage rates to be granted the United Mine Workers. Some bituminous is sold under contract with an escalator arrangement which will permit the coal industry to recover its added costs, but operators expect they'll have to go back to old prices when new contracts are signed, many of them in the first few months of 1959. "There's just too much coal around," complains one producer. The miners will get $1.20 more a day on Jan. 1 and another

80-cent hike next Apr. 1. Their present basic daily wage is $22.25. One unusual feature of the contract: Commercial mines agree to handle no coal produced at nonunion mines, but the captives refused to go for this, fearing possible antitrust complications. The result is a dual contract, unique for UMW.

Steel Firms, Union Lose in Ohio SUB Case

Four steel companies and the steel union last week were still considering what to do about the Ohio Supreme Court decision that outlawed state and private unemployment compensation being paid at the same time. Some $18 million is tied up in Supplemental Unemployment Benefits that U. S. Steel Corp., Republic Steel Corp., Jones & Laughlin Steel Corp., and Youngstown Sheet & Tube Co. wanted to pay out to their Ohio workers who had been laid off.

Putting Standards To Work: How Rockwell Does It

How do you get standards that are practical and satisfying to all in a multiplant operation? Rockwell Mfg. Co. does the job with a decentralized standards department. There's a free rein for cost cutting. In one project alone, the company reduced 123 types and sizes of hex nuts to 54. Annual savings: More than $5000 (Page 70).

Goldberg Proposes Labor-Management UN

Take another look at a proposal to help keep labor peace advanced by Arthur Goldberg, counsel for the steelworkers and the AFL-CIO. He wants two meetings a year of two or three weeks' duration in which company presidents and chairmen meet with union presidents. The meetings would be sponsored by the government and perhaps chaired by the secretary of commerce or labor, or by both. He looks upon the forums as debating sessions, something like the United Nations. Problems may not be settled, but they will at least be aired and tensions eased.

Britain Sees '59 Recovery; Nationalized Industries Lag

Keep your eye on Great Britain. John Bull is pulling out of his recession, just as we are. Since he's both a customer and competitor, his market fluctuations affect you. Look for more British cars to pour into the U. S. Look for more British machinery to compete with ours in overseas markets, particularly South America and Japan (Page 78). Britain's publicly owned industries lag, however.

Numerical Controls Save Maintenance

If you've been putting off buying numerically controlled equipment because you've heard maintenance costs are excessive, here's an eye opener. When you consider numerically controlled machines in the light of their productivity, they can cost you less to maintain than their manually controlled counterparts. Maintenance costs will diminish after you pass through the initial shakedown. You can't afford to pass up the benefits of numerical control, believes Boeing Airplane Co. (Page 108).

Switchgear Price War Easing?

The price war in switchgear may be ebbing. At least one producer, Federal Pacific Electric Co., Newark, N. J., has gone back to its old prices. The range of price cuts to utilities and industrial power users has yet to reach the proportions of the 1955 "white sale." This time, they're ranging from 10 to 50 per cent below normal.

STEEL Queries Automotive Suppliers of Parts, Materials

Key automotive suppliers think their business with motordom will be 20 per cent higher next year. Producers of aluminum parts expect even better gains (Page 68). Even if you aren't directly involved in automotive activity, it pays to keep tabs on Detroit economic trends because accelerating auto production will be the key to a sharp recovery for metalworking generally. And auto suppliers, whose business life depends on making accurate estimates, believe at least 5.5 million cars will be made next year, compared with 4.3 million in 1958.

Here's Roundup on Labor Trouble Spots

Caterpillar Tractor Co. and the United Auto Workers reached agreements ending strikes at most of the firm's plants. Terms: Wage hikes ranging from 8.5 to 17 cents an hour this year, and increases of 6 and 7 cents effective in October, 1959 and 1960 . . . Studebaker-Packard Corp. also has agreed to a wage increase with the UAW, but many other issues that would boost costs have been deferred . . . International Harvester Co. and the UAW were still apart last week. Some 36,000 have been idle at 15 plants since Nov. 13 . . . The nine-week walkout of 1800 United Steelworker members also continued last week at Harnischfeger Corp., Milwaukee.

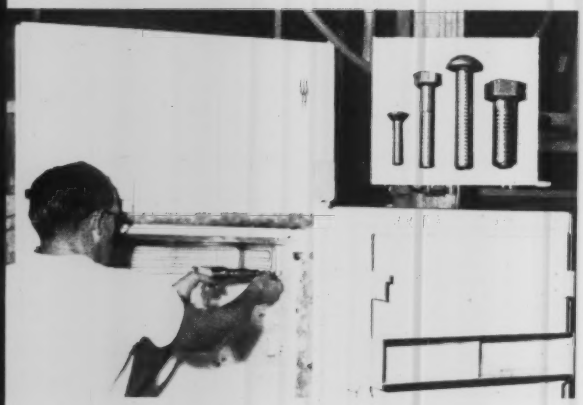
More Russian Steel Exports Coming

Look for more Russian steel products to appear in world markets, warns Max D. Howell, executive vice president of the American Iron & Steel Institute. The exports will probably be in the form of heavy steel products,

such as structurals, rails, and pipe. At present, about 80 per cent of Russian steel goes into defense and related projects. Here, 15 percent is for defense.

Banner Year Ahead for Ferroalloys

Watch the ferroalloys. They should have a banner year in 1959 because of developments in vacuum technology and because more and more special steels are needed for the space age. Ferroalloy producers turned out 1.8 million tons last year worth $440 million, says J. H. Brennan of Union Carbide Corp.'s Electro Metallurgical Co.



Aluminum Fasteners Make Gains

Have you considered using aluminum bolts and screws for aluminum fabricating jobs? They offer the same clamping strength as steel with half the applied torque. The same metal in structure and fasteners gives the product a uniform look. Aluminum fasteners are lighter and cost less and have the right combination of strength and corrosion resistance. They're available in most of the standard types and sizes. Popular bolts are hexagon-head and carriage types (Page 130).

Notes on the Air Age

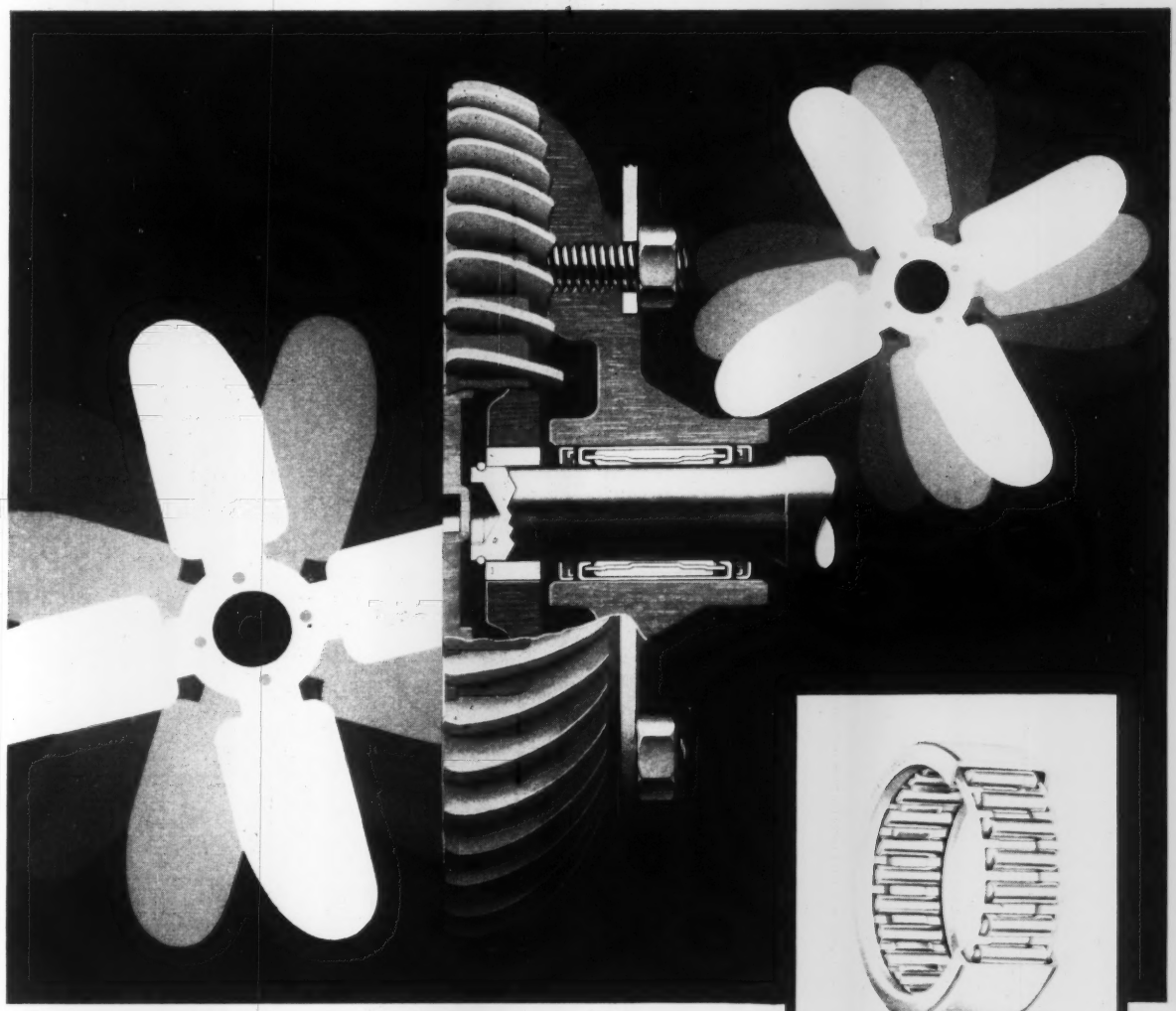
Last week's revelations about the Russian atomic plane were probably leaked by the Pentagon. Some proponents of our own project (see STEEL, Nov. 24, p. 60) are trying to get our program off dead center . . . But government spokesmen vehemently deny they know anything about a Russian moon shot . . . Nearly 4000 missiles, not counting the air-to-air types, are scheduled to be made in the U. S. next year. Boeing's Bomarc will be emphasized.

Job Shop Takes Up Explosive Forming

Chromalloy Corp., White Plains, N. Y., is the latest to join a growing list of job shops equipped to do explosive forming. It acquired its experience by forming 11 ft rocket booster cases. Dr. Robert A. Cooley, executive vice president, lists these advantages for explosive forming: Reduced capital investment for short runs, precise movement of metal, simplicity. (Page 128).

Straws in the Wind

Wages and salaries of Westinghouse Electric Corp. employees on escalation will be reduced by either 1 cent an hour or by 0.5 per cent of 1955 rates because of the quarterly drop in the costs of living . . . General Motors Corp. workers on escalation will get no cost-of-living allowance adjustment . . . The strife-torn Kohler Co. will increase wages 5 per cent . . . Canada faces a $1 billion deficit in the 1959-60 fiscal year and may boost excise taxes.

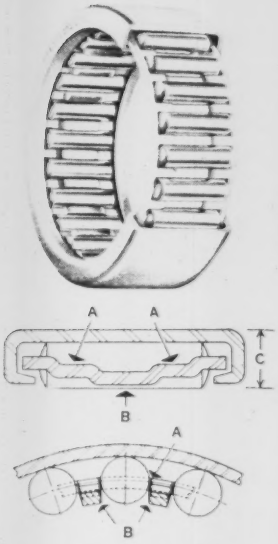


Schwitzer Variable Speed Fan Drive features new Torrington Bearing for economy, stability, lifetime lubrication

The original design of the Schwitzer Fan Drive, used in passenger automobiles to reduce fan horsepower and noise, called for two ball bearings. By replacing these with one Torrington Drawn Cup Roller Bearing, Schwitzer engineers have simplified the design and reduced costs.

This unique bearing firmly supports the drive housing and fan so they run true despite possible couple loads due to gyroscopic action. Ample lubricant reserve capacity permits pre-lubrication for the life of the fan drive.

Many new opportunities for economy, design simplification and operating improvements are opened up to engineers and designers by the new Torrington Drawn Cup Roller Bearing. Services of Torrington's engineering staff are offered to help you with product development work. **The Torrington Company, Torrington, Conn.—and South Bend 21, Ind.**



- rollers end-guided at pitch line (A)
- shaft-riding retainer (B) designed to permit lubricant circulation
- high capacity in small cross section (C)
- long pregreased life
- efficient at high speeds
- mounted by press fit
- simple housing design
- low unit cost

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Power Plant Ducts Demonstrate Corrosion Resistance, Strength, Low Cost of Armco ALUMINIZED STEEL

These king-sized ducts made of Armco's special hot-dip aluminum-coated steel demonstrate its advantages wherever corrosion resistance must be combined with strength at low cost.

Based on previous experience with ALUMINIZED STEEL, here's why Detroit Edison engineers specified this two-in-one metal:

- eliminates cost of painting
- reduces heat loss because of its heat reflectivity
- provides high strength and rigidity
- reduces maintenance expense
- costs less than other metals with comparable properties

PROVIDES "COMPETITIVE EDGE"

Wherever you need a sheet steel for outdoor service, ALUMINIZED STEEL Type 2 can give your products sales advantages at a cost that can put you a step ahead of your competitors. Manufacturers of farm equipment, building products, truck bodies, roofing and a wide range of industrial and consumer products are using the material effectively.

For complete information on Armco ALUMINIZED STEEL Type 2 and its companion grade, ALUMINIZED STEEL Type 1, (used for resistance to a combination of heat and corrosion), just fill out and mail the coupon.

ALUMINIZED STEEL air ducts in Detroit Edison's huge River Rouge Power Plant provide superior performance at low cost.

ARMCO STEEL CORPORATION, 2498 Curtis St., Middletown, Ohio

Send me information on Armco ALUMINIZED STEEL. We are considering it for_____

New steels are born at Armco

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1959: No Pushover!

We agree with people who predict that 1959 will be a better year for metalworking than 1958. But our optimism has certain qualifications.

This is the setting:

Metalworking sales this year will total $120 billion, off about 15 per cent from the 1957 record of $140 billion.

We are now making a transition from a period of economic hesitation to a new era of prosperity.

Preliminary estimates place metalworking sales next year at $135 billion, slightly more than 10 per cent above 1958's.

Metalworking could even establish a sales record in 1959 as a prelude to what our editors call the "soaring sixties."

The outlook is fortified by the continued high rate of personal income and spending, the expanding future needs of a population (190 million in 1965, vs. 175 million in 1958) growing at the rate of more than 3 million a year, and heavy expenditures needed for defense in the space age.

The $20 billion setback in 1958 sales had the wholesome effect of spurring many companies to develop broad cost reduction programs; to study and improve systems and procedures; to weed out inefficient and excessive personnel; to develop new products with more sales appeal; and to overhaul sales and promotion programs.

The setback also had its negative side. Many companies postponed purchases of equipment which was needed to cut unit production costs; or let equipment get out of repair; or cut inventories so deeply they lost business because they couldn't fill orders promptly; or went too far in reducing manpower; or delayed the development of new and improved product lines.

The basic problems brought so sharply into focus during the 1958 recession will not disappear as sales make a comeback.

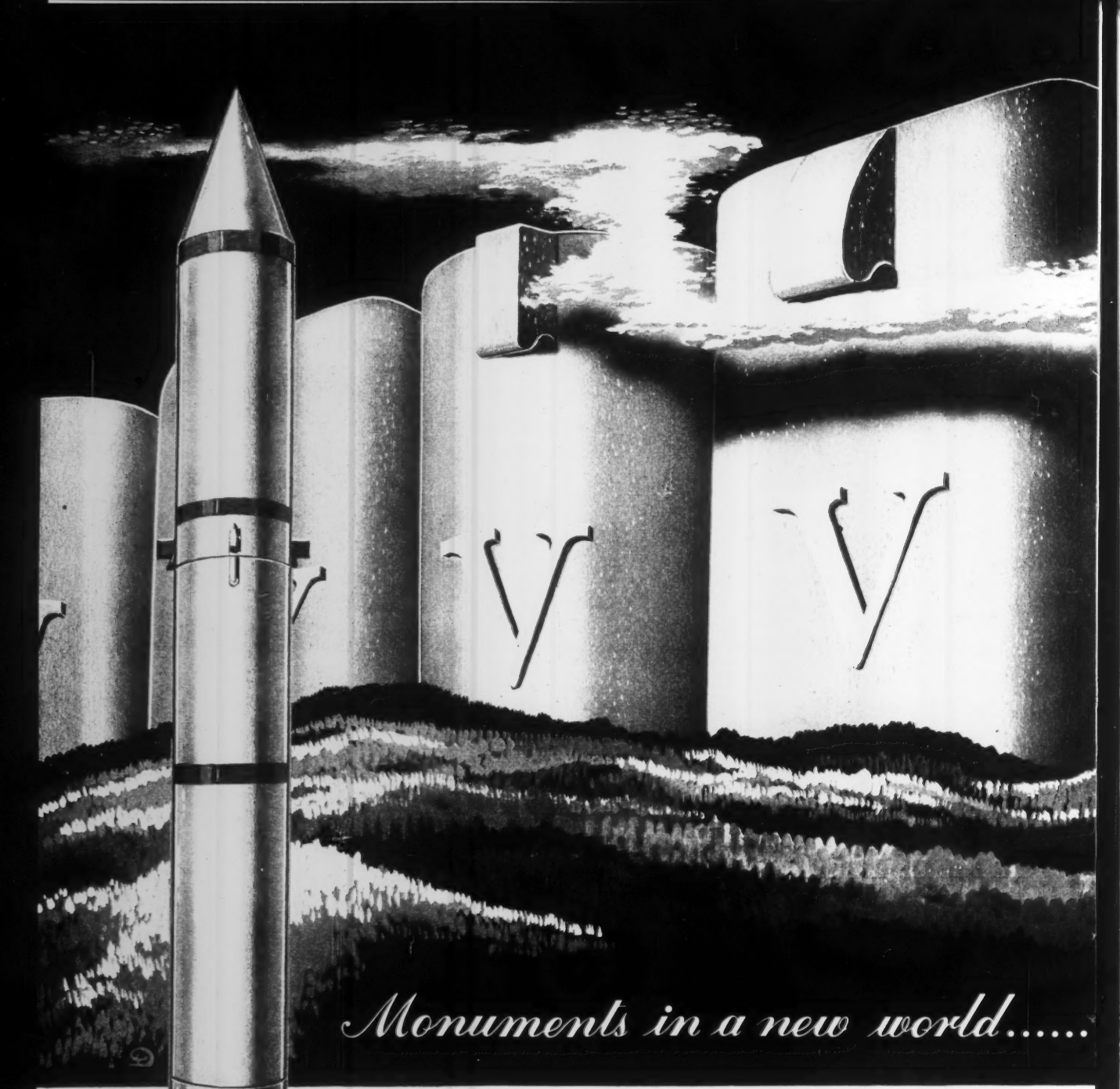
Some defy solution—such as rising material and wage costs and the burden of heavy taxes. Others do not—such as the need for sharper production efficiency, the need for closer inventory control, and the need for the development of products that can be sold on the bases of quality, performance, and service rather than price.

In your planning, don't let your prospects for better business conceal the fact that 1959 is going to be a tough, competitive year. You'll have plenty of opportunities for problem solving.

In our book, 1959 will be no pushover!

Irwin H. Such

EDITOR-IN-CHIEF



Monuments in a new world.....

Valley ingot moulds are designed for individual steel plant conditions. These moulds meet today's metallurgical requirements

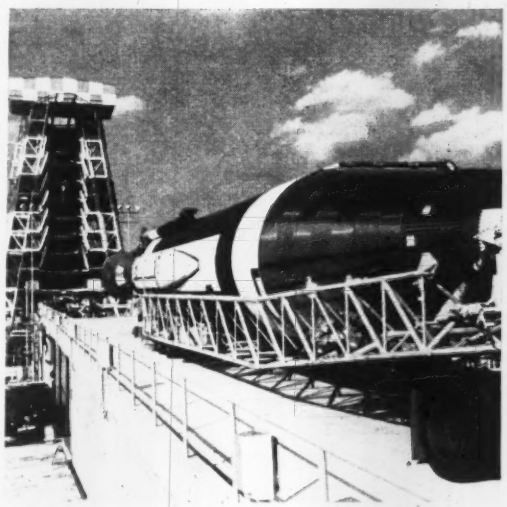
VALLEY MOULD AND IRON CORPORATION

GENERAL OFFICES: HUBBARD, OHIO

Western Office: Chicago, Illinois. Northern Office: Cleveland, Ohio

Metalworkers To Do 4% More Defensework

STEEL finds 33.7% of metalworking plants do defensework. Their expectations for '59:



U. S. Air Force's Atlas

Production Volume (1959, vs. 1958)

. . . 43.9% expect an increase
. . . 14.4% expect a decrease
. . . 41.7% expect same

Increases Expected

By Major Industry Groups:

Primary metals	1.9%
Fabricated metal products	2.4%
Machinery (except electrical)	5.0%
Electrical machinery	4.6%
Transportation	7.0%
Instruments, related products	3.3%
Other groups	1.8%

By Plant Size:

Plants employing 20-99	4.4%
Plants employing 100-499	2.3%
Plants employing 500 or more	5.8%

NOW'S A GOOD TIME to get into defensework. Defense budgets are snowballing, (see Page 64). And metalworking's share of the outlay is growing as new designs are translated into hardware. Russia's development of an atomic-powered plane will tend to push outlays even higher.

• **Expectations**—STEEL asked general managers of metalworking plants engaged in defense production to estimate their 1959 defensework volumes. Nearly nine out of ten expect to do as much or more business with Uncle Sam next year as they did this year. Net result: A 4 per cent increase in metalworking's military sales.

• **Who'll Gain Most**—Transportation equipment and machinery producers look for the largest gains; a good part of their production will be ground support equipment for missile bases. The Florida Div., Food Machinery & Chemical Corp., Lakeland, Fla., expects to do at least 15 per cent more defensework in 1959 than it did this year.

Reports W. A. Dubovick, president, Engineered Precision Castings Co., Matawan, N. J.: "A lot of designwork is being cleaned up now and translated into orders for hardware. We expect a surge of bookings from aircraft and missile people in early 1959. It'll probably level off somewhat by summer."

• **Size No Barrier** — Pickings are good for small firms, and any switch in policy during the next couple of years would probably be to their advantage. One small company, Met-Pro Inc., Lansdale, Pa., anticipates a 300 per cent gain in its defense production next year. Reason: It landed a huge contract to make mobile water purification units for the Corps of Engineers. An officer of the company told STEEL that 90 per cent of the firm's 1959 production will go to Uncle Sam. He believes that it's easier for a small company to get sizable contracts from the government than from private industry—if you can meet government specifications and delivery schedules.

• **Long Range**—Respondents generally believe defensework will be lucrative for a long time, despite harassments like renegotiation (see Page 64). Jack N. Wentz, assistant to the manager of operations and manufacturing, Air Products Inc., Allentown, Pa., contends: "We're in an upward trend that we expect will continue."

More Defense Dollars Mean Renegotiation's Here To Stay

Fiscal	(Spending in billions) Conservative Estimate	Liberal Estimate
1964	$48.0	$55.0
1963	45.8	51.5
1962	44.5	49.0
1961	42.5	45.8
1960	41.3	42.8
1959	40.8	41.0

This is the final article in STEEL's study of chances for renegotiation reform, a three-part series that began Nov. 24. Pentagon, Congress want some kind of control

PRESIDENT Eisenhower will probably request the extension of the Renegotiation Act to June 30, 1962. Neither the administration nor the Pentagon has much doubt of the act's usefulness.

The three-year extension, it will be said, is designed to give the Renegotiation Board (which administers the act) a better chance to hire, train, and keep competent personnel, as well as to develop continuity in its approach to "excessive" profits. The longest extensions of the law since Korea have been for two years. The most recent was for six months to give the next Congress a chance to re-evaluate the act in light of new contracting techniques and new weapons technology.

• **Must Have It**—Defense Department sources deny that renegotiation is used as a crutch for bad contracting methods, as is charged by the National Association of Manufacturers and some other industry groups. Military sources generally regard renegotiation as valuable backup to such contracting techniques as redetermination and incentives. Without it, they claim, Defense would have no protection against "profiteering" which can result from scientific or technical breakthroughs not foreseen when the contract was written.

A spokesman for our space agency, the National Aeronautics & Space Administration, tells STEEL: "The cost of new, intricate systems needed in space cannot be evaluated." The Air Force's Advanced Research & Development Command is even now studying three types of space warfare: Orbiting the earth, orbiting the moon, and operating outside the gravitational forces of either this planet or the moon. When contracts are let for such projects, no one will be able to predict within hundreds of millions of dollars what the ultimate cost will be.

• **Fee System** — One contracting technique which may find greater favor among defense industries in the future is the flat fee system. Thompson Ramo Wooldridge Inc.'s original fee on the Air Force's ballistic missile program was 14.3 per cent of the value of the work. It has since been reduced to 10 per cent, and could be cut more as missile research and development becomes production work. The fee system is popular among some defense agency personnel because it tends to allow the contractor more freedom to produce better work. It is one answer to renegotiation critics who charge that the act strangles original work by destroying the profit motive.

"No one has ever refused any government business because of renegotiation," says a high defense official. "There's plenty of work and plenty of money for everyone," he adds. Contractors who complain about the principle of renegotiation are on weak ground. But he believes that changes could be made in administrative methods.

• **Adamant**—At the opposite pole is the U. S. Chamber of Commerce. A spokesman close to the chamber's strategy for the next Congress tells STEEL renegotiation is a "tax without a rate. Next year we have the best chance ever to kill it."

He thinks the freshmen congressmen hold the key. "They will have to study the problem from scratch and will tend to be more open minded than members who have heard renegotiation discussed before." This source claims the defeat of renegotiation will come about with good public relations. But it won't be easy: "The problem is how to sell the idea to them."

In evaluating the business philosophy of the new Congress, he guesses that action on renegotiation will be tougher to get than depreciation reform.

• **Acceptable**—Rep. Wilbur Mills, (D., Ark.), chairman of the Ways & Means Committee, remains cagey about his plans for renegotiation next session. Chances are he will follow the lead of the Joint Internal Revenue Taxation Committee staff, which is talking privately to industry. Sen. Harry Byrd (D., Va.) is chairman of the group, and Representative Mills is vice chairman. Of the two, Mr. Mills is inclined more toward industry's point of view, but he has yet to indicate that he would accept any major modifications of the Renegotiation Act.

It's difficult to gage committee thinking now because the Ways & Means Committee will have seven new members (three Democrats, four Republicans), the Senate Finance Committee four (all Republicans). But chances are the new members will tend to be less inclined to amend renegotiation than their predecessors who retired or lost out in the November elections.

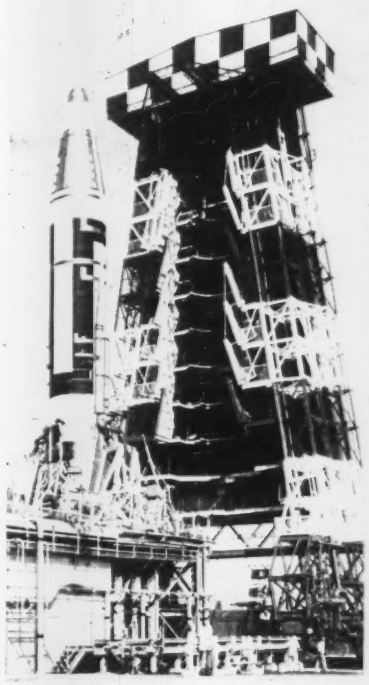
• **High Floor?**—The possibility of doubling the present floor for renegotiation ($1 million) is being discussed. Small business enthusiasts on Capitol Hill point out that only a small percentage of the refunds come from companies that barely qualify. The 100 leading contractors to the Pentagon may soon account for more than 90 per cent of the refunds, guesses one source.

Observers give an amendment to allow U. S. Tax Court decisions to be appealed an excellent chance of passage. Reason: The House allowed it last session, although the Senate turned it down while waiting for the complete revaluation of the act next session.

The Aircraft Industries Association's move to seek a floor on incentive profits (STEEL, Dec. 1, p. 42) will run into real trouble because it is attempting to do just what the act is designed to forestall: Building a profit area which is not open to the examiners from the board. Opponents of the AIA will claim its program would allow contractors to hide much more than incentive profits from the board.

• **Bigger Defense Outlays**—The biggest roadblock to renegotiation amendments: Our defense budget is on a permanent swing upward, barring the millenium (see table). And as more defense dollars are shifted from personnel to hardware and research, the greater the percentage of the defense budget which will be subject to renegotiation.

Big items like $400 million for the Navy's atomic powered aircraft carrier also make renegotiation seem more logical to some folks, on the ground that a project manager could hide a lot of profit from the government within the intricacies of component subcontracting. They argue that high production runs of small items may be more profitable on the surface to the manufacturer but that it is easier for the Renegotiation Board to discover profits where the cost breakdown is comparatively simple.



Increasing federal spending for projects like this Atlas missile and its ground support equipment means that some form of renegotiation is here to stay

• **The Moral Question** — STEEL asked several spokesman for industry this question: "When you are all through talking about the Renegotiation Act itself, can you say that industry does or does not make too much on government contracts?"

Industry generally takes the stand that where bids are advertised for, it would be foolish to argue that profits are too high because supply and demand relations between the buyer (Uncle Sam) and the seller (industry) keep profits reasonable.

In the case of single source supplies or negotiated contracts, industry's point of view is best summed up by the U. S. Chamber of Commerce: "Any excessive profits would result from bad contracting procedures on the part of the government. If renegotiation were killed, the opportunity for such laxity would disappear."

• An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.

Luria Case Near Climax

Federal Trade Commission lawyers have filed their brief on the Luria Bros. & Co. case with Hearing Examiner John Lewis. Their action marks one of final stages of a proceeding that covers three years of testimony, 113 days of hearings, 275 witnesses, and more than 14,000 pages of transcripts.

Luria and others (including U. S. Steel Corp., Bethlehem Steel Corp., and 13 other steelmakers) are charged with violations of the Clayton Act and practices in restraint of trade. The FTC is asking the examiner to issue a cease and desist order.

A brief will be filed by Luria and the steelmakers by Jan. 5, 1959. Mr. Lewis will make his decision after studying both briefs, unless additional testimony is required. Appeals could prolong the case if the decision is against Luria and the steelmakers.

The FTC's lawyers told STEEL they plan to appeal a ruling of the examiner which dismissed charges against certain mills that allegedly conspired to lessen competition in the scrap industry.

Chemical Sales Climb

Chemical sales this year will probably equal last year's record of $23 billion, Gen. John E. Hull, president, Manufacturing Chemists Association, predicted at the organization's semiannual meeting in New York.

Business is still on the spotty side, he said, but volume has increased to $2 billion a month.

The general also stated that the MCA has told Washington officials it does not advocate compliance with a Russian request for technical aid from American chemical producers.

A plan to counteract state-sponsored research in Russia and to help meet international competition was advanced by L. G. Bliss, president, Foote Mineral Co. His proposal: Co-operative pure research sponsored by chemical companies.

"Research has become a major expense, and the cost is increasing rapidly," Mr. Bliss added. He estimates that the nation's expenditures will reach $15 billion by 1960.

Belts of tiny semiconductors get a final check at Hughes Aircraft Co.

Semiconductors Pack Punch

Watch the effect of transistors and other semiconductors on the electronic and electrical component industries. The mighty mites are beginning to move in volume

SALES of transistors, the mighty mites of electronics, will hit $140 million in 1959, a 40 per cent increase over this year's performance, predicts James H. Sweeney, manager of marketing for General Electric Co.'s Semiconductor Products Dept.

He thinks the future holds even greater promise: "In five years, we expect over 25 million transistors to be sold for instrumentation and control uses. This is the largest unit increase we can see for any transistor market. It exceeds the increase of units for television sets, auto radios, and even for data processing equipment within the next five years."

Mr. Sweeney believes that within the next decade better than 50 per cent of the transistors produced will be used in equipment that would not be practical with vacuum tubes.

• **That's Not All**—Two other semiconductors also hold great promise: Rectifiers and a new component, called controlled rectifiers. Sales of rectifiers have grown from $7 million in 1953 to roughly $58 million this year. Prediction for next year: $74 million.

Within five years, the annual dollar value of controlled rectifiers could approximate today's market for transistors, says Mr. Sweeney. (This year 44 million transistors will be sold.)

Rectifiers are replacing other means of changing alternating to direct current. They are also competing for a part of the electron tube function.

The controlled rectifier could be called a crossbreed. Like a transistor, it controls the flow of current; like a rectifier, it lets current flow in only one direction.

• **Big Future**—The first major application of controlled rectifiers will be in military equipment. As prices get lower, they will be used in such things as kitchen appliances, air conditioners, and brightness controls for lights.

Many more applications are anticipated. For example, they can be used to operate motors in machine tools and control systems, or supply regulated direct current to electroplating systems and welding machines.

• **Outlook** — The semiconductor component industry is growing about four times faster than its customers, the electronic and electrical industries, says Mr. Sweeney.

He predicts that the development of new materials and techniques will lead to entirely new systems, such as compact computers and truly portable TV sets.

Mr. Sweeney believes that the electronics industry will be well into its "industrial era" of growth by 1963. Military usage of transistors will become increasingly important because of the premium placed upon size, reliability, and low power consumption. Increasing applications of transistors are also expected in commercial computers, instrumentation and control, and in the communications industry.

Santa Won't Tighten Belt

Industry will keep up the tradition of parties, bonuses, and extra days off despite the recent recession. Few cutbacks are reported. 'Customer' gifts falling in disfavor

METALWORKING will put aside recession worries this Christmas for a celebration which will retain most of its traditional trappings. Prospects of a better new year will brighten many observances. Although spirits may flow a little less freely than they did when profits were higher, the sales slowdown of early 1958 won't crimp most festivities.

While employees hopefully anticipate parties and bonuses, management faces some important decisions. Their planning of such extras and working schedules which include two postholiday Fridays will have a sizable effect on company morale.

A Research Institute of America survey shows that the Christmas party continues to gain favor despite opposition from many executives. Some 57 per cent of firms polled will have holiday parties for employees —a gain over recent years.

• **For the Family**—The character of yuletide celebrations is changing because of management's mounting concern over the amount of liquor consumed. (It's served at two of every three parties.) One approach is being tried extensively: Invite the employee's wife or husband. By-products of this move are increased family identification with the company and less drinking. A Chicago survey reveals liquor will be served at only 60 per cent of office parties this year—a drop of 14 per cent since 1957.

Some of the fat may be trimmed from bonuses, but they'll still be hefty. A National Industrial Conference Board survey shows that the recession has had little effect on plans of companies sampled. Of 110 firms which gave bonuses last year, 68 will grant bonuses in 1958, six will stop the practice, and 36 have not announced their plans.

Although degree of employee participation varies widely, NICB says everyone on the active payroll is included in more than 75 per cent of these bonus programs.

Management may be discovering it's hard to discontinue a bonus for fear of damaging employee morale, even when it's clearly a gift from the company. Several firms will reduce their coverage or include a smaller number of individuals in bonus plans.

• **Aid to Morale**—An Ohio firm discovered it could build employee morale even though it cut back. It gave each employee 4 per cent of earnings in 1957. This year the firm squelched rumors that the bonus would be eliminated by announcing a 3 per cent yearend bonus in November. Employees appreciated early notification of the decision.

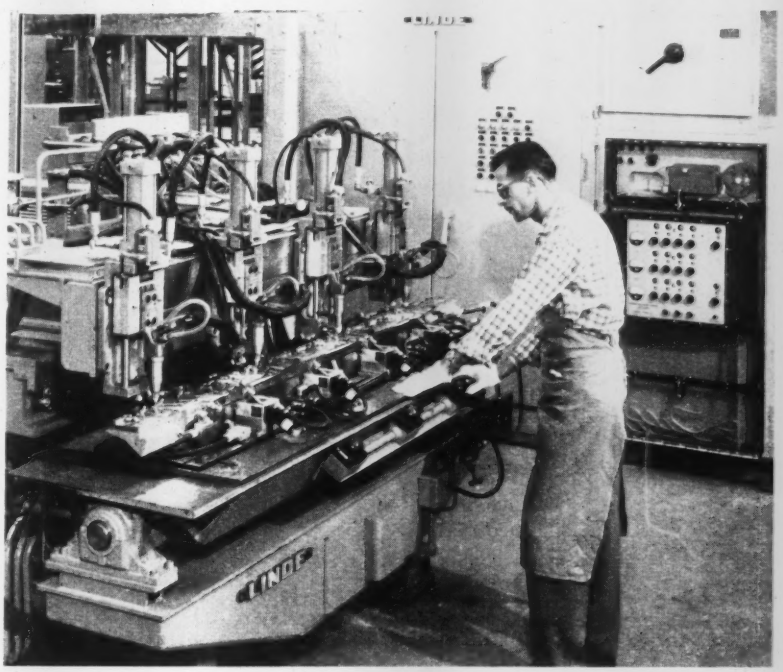
If profits hold to a healthy level, bonuses could become as traditional as the office party. Some 97 per cent of firms surveyed by the NICB have granted the extra cash for at least ten years, while seven have given bonuses for 40 years or more.

An increasing number of firms object to the giving and receiving of "customer" gifts. In fact, many executives say they haven't lost business by curtailing gifts to customers.

• **Four-Day Weekend** — Management has an extra decision to make this year: Will the plant and office work on Friday following Christmas and New Year's?

Associated Industries of Cleveland reports that member firms which have decided to be idle in both office and factory on Dec. 26 outnumber those doing business as usual 2 to 1. On Jan. 2, about two-thirds of the plants and offices will be on normal schedules.

Most firms will grant some free time to employees on Dec. 24. A survey of the Employers Association of Chicago shows that 86 per cent of offices and 81 per cent of plants will close early on Christmas Eve. Few employers will extend the concession to Dec. 31.



TAPE CONTROLLED HELIARC WELDER completes four subassemblies at once for Terrier antiaircraft missiles. Machine positions torches, tilts work to proper angle, and selects correct time and current for weld

Automotive Suppliers Predict

Here's good news for metalworking. STEEL checked the pulse of suppliers to the auto industry, found: They look for passenger car production in 1959 to climb around 20 per cent above the

"Captive shops are taking more business . . ."

Carter C. Higgins, president, Worcester Pressed Steel Co., Worcester, Mass.: "Our sales to auto manufacturers in 1959 will run about the same as they did in 1958 and probably 20 per cent above 1957's. The reason we don't look for greater sales is that one of our parts—a wire mesh bug screen—has been designed out of the picture. Captive shops are taking much more business than they were five years ago. But nothing in particular is being taken over by them this year."

"Sales . . . to bounce back strong in 1959."

O. A. Schilling, sales manager, Industrial Products Div., Goodyear Tire & Rubber Co., Akron: "We're estimating the automotive industry will need 25 to 30 per cent more of our products this year than last. Industrial rubber goods sales to the passenger car market are expected to bounce back strong in 1959. The auto industry's most conservative estimate is to build 1 million more cars next year than this year. Each additional car must have almost 500 rubber or rubberlike parts."

"For us, a considerably better year."

Robert E. Klare, general manager, Federal - Mogul Corp., Detroit: "We're looking for a 5.5 million car year. For us, that means a considerably better year than 1958, though not as good as 1957. Our sales gains will be tied directly to increases in auto production."

"Our 1959 auto business will be about the same as 1958's."

L. M. Hogan, sales vice president, Standard Tube Co., Detroit: "We expect our 1959 auto business to be about the same as 1958's. We've lost some parts on the '59 models, but the volume on parts we're still making should be about 20 per cent higher than 1958's."

Sales Gains in '59

1958 mark. Their views are supported by car dealers whose order books are far fatter now than they were a year ago. It augurs well for a quick recovery. Here are leading suppliers' forecasts:

"... our advisers have raised their estimates."

George W. Stamm, vice president in charge of sales, Crucible Steel Co. of America, Pittsburgh: "Everything we've been able to find out by talking to the auto people and our economic advisers points to substantially increased sales in 1959. We believe the new cars will use as much stainless per unit as they did in 1958. We're currently booking orders for January, and we expect business to be good through April and May. If the auto companies fear a midyear steel strike . . . they may accelerate their steel buying. Last month, our advisers raised their estimates of '59 auto output."

"We expect a corresponding increase."

Austin R. Zender, president, Bridgeport Brass Co., Bridgeport, Conn.: "If the auto industry's forecast of increased production holds true, we expect a corresponding increase in our 1959 business. That would come in shipments to both automakers and their suppliers. We do not look for a decrease due to substitute metals because the amount of copper and brass in a car has been substituted to its saturation point."

"We expect to sell more aluminum . . . for '59 models."

R. V. Davies, vice president and general sales manager, Aluminum Co. of America, Pittsburgh: "We expect to sell more aluminum to the automotive industry for the 1959 model run than we did for the 1958 cars for two reasons: 1. More cars will be built. 2. More aluminum will be used per car."

"Unit sales . . . will be 20 per cent better."

Wade N. Harris, president, Midland-Ross Corp., Cleveland: "It's my opinion that our unit sales to the passenger car market in 1959 will be 20 per cent better than they were in 1958. Dollar volume could rise even more due to higher labor and material costs."

"We'll sell the same dollar volume per car in 1959 . . ."

C. O. DeLong, president, B. F. Goodrich Industrial Products Co., Akron: "We'll sell the same dollar volume of industrial rubber goods per car in 1959 as we did in '58. So our business will rise—or fall—in direct proportion to the increase—or decrease—in the number of cars built."

Setting standards at plant level helps Rockwell get more efficiency at less cost. The company has standardized fastening and assembly techniques in making 25,000 different models and sizes of products

Making Standards Work

Rockwell does it by decentralizing its standards departments. The result is lower costs. Example: 123 types and sizes of hex nuts were cut to 54 with annual savings of $5000

HOW CAN YOU, as a manager in a diverse, decentralized company, realize maximum savings through the standardization of materials, parts, and practices?

The answer: Decentralize your standards department, says Fulton R. Magill, manager, Central Standards Dept., Rockwell Mfg. Co., Pittsburgh.

Mr. Magill points out that any company can benefit from a central standards department. His company has saved thousands of dollars in recent years. But, he stresses, Rockwell was "laying the groundwork for a decentralized effort."

Why decentralize?

Says Mr. Magill: "Mandatory standards developed in company headquarters and disseminated to line executives usually don't work well. There are too many variables from plant to plant. On the other hand, getting acceptance of voluntary standards is a time consuming and expensive procedure."

Solution: A decentralized staff with a representative in every plant where potential savings will justify the services of a standards engineer.

• **How It Works**—In 1956, Rockwell took the first step toward decentralization. A central standards department was formed. Responsibility for division standardization was given to one man in each plant (usually the chief engineer). The company recently appointed its first full time plant standards application engineer at one of its larger plants.

There have been no mandatory standards. Each standard issued from the top has been developed from data submitted by operating units for acceptance or rejection by the company.

Example of how the program is working: Executives of two plants took a list of 123 types and sizes of hex nuts that had been "recommended as standard inventory" throughout the company and reduced it to 54. Only 27 items retained original specifications. Besides savings in reduced inventories, order writing, and related procedures, the changes reduced the cost of 72 per cent of the nuts used by the two divisions. Savings in cost and assembly time were over $5000 per year.

• **Why a Specialist?**—Mr. Magill points out that the creation of standards requires time and a degree of specialization. It is best done at plant level.

He explains: "Design engineers, manufacturing, and purchasing executives are concerned only with producing the highest quality products at the lowest practical cost.

"The standards engineer has an over-all responsibility: Establishment and application of standards that satisfy everyone."

To be successful, Mr. Magill adds, the engineer must work with engineering, manufacturing, and purchasing departments. He must determine each standard consistent

with quality requirements, and it must be capable of saving the company money. It is his responsibility to provide the initiative, collect the knowledge, and do the detailed work on which standards are made.

If a standards specialist on the plant level is to do your company any good, he must also be a teacher. It's up to him to educate plant executives in the objectives of standards. He must show engineering, production, and purchasing how standards can cut costs without lowering quality.

Finally, he must know what he's doing. He's on the spot to watch for applications where standards will pay off. He can examine material specifications, engineering design, drafting methods, and the procurement of parts. If he does it well, he'll find places to save money.

• **Why a Central Department?**—Even with decentralization, the central department will still be needed to "co-ordinate" and correlate the work on standards in individual plants," says Mr. Magill.

Hawaiian Bauxites Flunk

Hawaiian bauxite samples have proved disappointing in preliminary tests, reports the U. S. Bureau of Mines, Washington. The bureau wasn't able to produce commercially competitive products with samples treated by simple upgrading methods.

The bureau said: "The tests cannot be considered completely conclusive. Additional metallurgical research is justified in view of the apparent immensity of deposits."

Offers Cleaner Scrap

An improved grade of scrap will be made possible by a new process of burning old automobiles developed by Lipsett Steel Products Inc., New York.

Lipsett, a subsidiary of Luria Bros. & Co. Inc., invested over $400,000 in an enclosed furnace which burns autos in production-line fashion. Capacity per day: 200 auto bodies.

Scrap quality is improved by the reduction of metallic and nonmetallic contaminants, the firm adds.

Cut 4-Day Job to 4-5 Hours

FOR Allis-Chalmers Mfg. Co.'s Processing Machinery Dept., the above setup masters the three clerical problems of renewal part order processing: 1. Duplication of effort. 2. Time. 3. Human error.

• **What It Is**—The nerve center of the IBM-equipped installation is a Cardotype control unit. It has two keyboards for entering nonrepetitive numerical information; an arithmetic unit for computing price extensions, totals, and discounts; and a unit that reads information from punched cards.

The procedure is such that repetitive information (like "ship to," "bill to," "price," and "part description," are punched on IBM cards and proofread once—no further checking is required. Prepunched unit prices eliminate manual extensions, totaling, discounting, and checking, reports E. T. Slackford of the Processing Machinery Dept.

• **How It Works**—An operator produces forms for six departments on the master typewriter (see above). Simultaneously, typewriters No. 2 and 3 pick up signals from the master unit and automatically produce shipping tags and forms for eight other departments. Meanwhile, the key punch unit is receiving select information and preparing cards for these purposes: 1. Material control for ledger accounting. 2. Cost work. 3. Invoicing.

• **Advantages** — The system was designed to fit in with a new renewal parts manual, Mr. Slackford points out. The manual is distributed with each new processing machine. It lists a catalog number, the quantity supplied, and the description of every machine part.

To identify components quickly, catalog numbers are actually locating numbers. For example, bearing retainers on crushers are designated by the same digits as the catalog number of all crushers. Parts are listed by basic name (bolt, dust collar) and indexed alphabetically.

Identical manuals go to the customer, field sales office, and renewal parts office. Significant changes in equipment are recorded in the manuals.

Sputniklike Atmosphere Clouds Washington Spending, Tax Outlooks

REPORTS of a Russian atom plane and the firing of a rocket beyond the moon are moving the bureaucrats here as they haven't been moved since the first sputnik was launched last year.

The developments come on top of President Eisenhower's order to cut back defense and nondefense spending (with the exception of foreign aid, which may be boosted $1 billion). The new and strongly Democratic Congress will be questioning Eisenhower's move and also any action that might curb federal income even temporarily. As a result:

1. Chances for renegotiation reform are slipping rapidly (see Page 64). 2. Rep. Wilbur Mills (D., Ark.), chairman of the tax-writing Ways & Means Committee, has announced a campaign to close tax "loopholes." 3. A revised Bulletin F on depreciation is being held up at the Internal Revenue Service until Treasury gets a better understanding of the receipts it can expect in fiscal 1959 and 1960.

Recent reports on Bulletin F (STEEL, Nov. 3, p. 46) indicated IRS was about to adopt the ten-year life formula. Sources close to IRS now think it may hold up any action until Congress reconvenes. Officially, Bulletin F is still "under review."

Auto Dealers Look to Congress

Charging that the Justice Department is deliberately avoiding looking into possible antitrust actions against the auto manufacturers, Frederick Bell, executive vice president, National Automobile Dealers Association, says Justice exhibited "immature judgment" in bringing charges of price fixing against auto dealers.

In the next session of Congress, says Mr. Bell, the dealers will seek legislation "that will allow the manufacturers to allocate a sales territory to each dealer . . . to reward the dealer for good performance and to penalize the dealer who drags his feet." NADA also wants the 10 per cent excise removed.

Studies American Investments Abroad

The House Ways & Means Committee has started an intense analysis of private U. S. investments abroad. The action is in line with a bipartisan move on Capitol Hill to substitute as much private investment as possible for our multibillion dollar foreign aid program. Our investments in 1957 were on the long side of $54 billion—almost $37 billion was private funds. Direct private investments amount to about $25 billion, while the remaining $12 billion is mostly in stock ownership, with relatively little management responsibility, or short term loans.

Private investments have about doubled since 1950, as have U. S. exports. Henry Kearns, assistant secretary of commerce for international affairs, told the committee the relation between investments abroad and exports is "more than coincidental."

U. S. direct investments abroad break down this way: 35 per cent are in Latin America, 33 per cent in Canada, 16 per cent in western Europe, 9 per cent in the Middle East and Africa, and 7 per cent in other countries. Over one-third of the money is in oil. Almost another third is in manufacturing.

The Commerce Department is surveying the overseas efforts of U. S. firms. Biggest hindrance to them: Lack of tax concessions.

Several Plans Are Viewed

High on the list of administration proposals which may go to Congress in January is a reduction in the corporate tax rate. Investors in underdeveloped countries would be favored by a 38 per cent rate, instead of the usual 52 per cent. (The reduction now applies only to western hemisphere investments.) Other possibilities include rapid tax writeoffs on foreign investments and postponement of U. S. tax payments.

C. Douglas Dillon, undersecretary of state for economic affairs, reports that U. S. corporations will soon receive credit for foreign taxes which they do not pay. Several countries offer to forego their taxes on U. S. firms to entice them into capital expenditures. In the past, the U. S. firm was forced to pay higher taxes here: It had not paid any foreign taxes which could be applied against U. S. taxes. Now Uncle Sam will give such companies relief, says Mr. Dillon.

Most of the plans being considered by the administration will be aimed at increasing U. S. investments in major underdeveloped areas.

To Strengthen Air Pollution Law

Arthur S. Flemming, secretary of health, education & welfare, is on record for "strengthening the Federal Air Pollution Control Act" where interstate problems are involved. He seems particularly concerned about auto exhaust gases, noting that "the auto industry should intensify its activities" to eliminate the exhaust gases or minimize their effect.

Increased federal activity is forecast by observers, including a move to force private industry to do a better job of eliminating air pollution.

Stockpile for Scrap?

The Institute of Scrap Iron & Steel met last week with the Office of Civil & Defense Mobilization to discuss the significance of scrap's declining role in steel production. Increased reliance on iron ore and hot metal in 1958 signifies future trends in the industry, a spokesman fears. An emergency like Korea would demand quickly increased steel production with a rising need for scrap, but the capacity would not be available, especially if normal scrap producers like the auto industry were shut down to tool up for war. The answer: A scrap stockpile. OCDM's reaction to the scrap industry's argument should be available soon.

Got a pain in the neck?

IF GRINDING PROBLEMS ARE GIVING YOU A PAIN IN THE NECK, SWITCH TO CINCINNATI (PD)° WHEELS. For *now* CINCINNATI Grinding Wheels offer POSITIVE DUPLICATION—a remarkable achievement in precision manufacturing and quality control that *can save you money . . . and increase your production.*

And we're definitely not sticking out our neck when we make these claims, because through the CINCINNATI (PD) Manufacturing Process you are assured Positive Duplication of the original wheel *every* time you reorder. "On grade" with a CINCINNATI (PD) WHEEL means all future (PD) WHEELS will act and grind exactly alike.

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Just contact us and we'll send one of our representatives—men who know grinding and grinding machines as well as grinding wheels. Write, wire or telephone Sales Manager, Cincinnati Milling Products Division, The Cincinnati Milling Machine Co., Cincinnati 9, Ohio.

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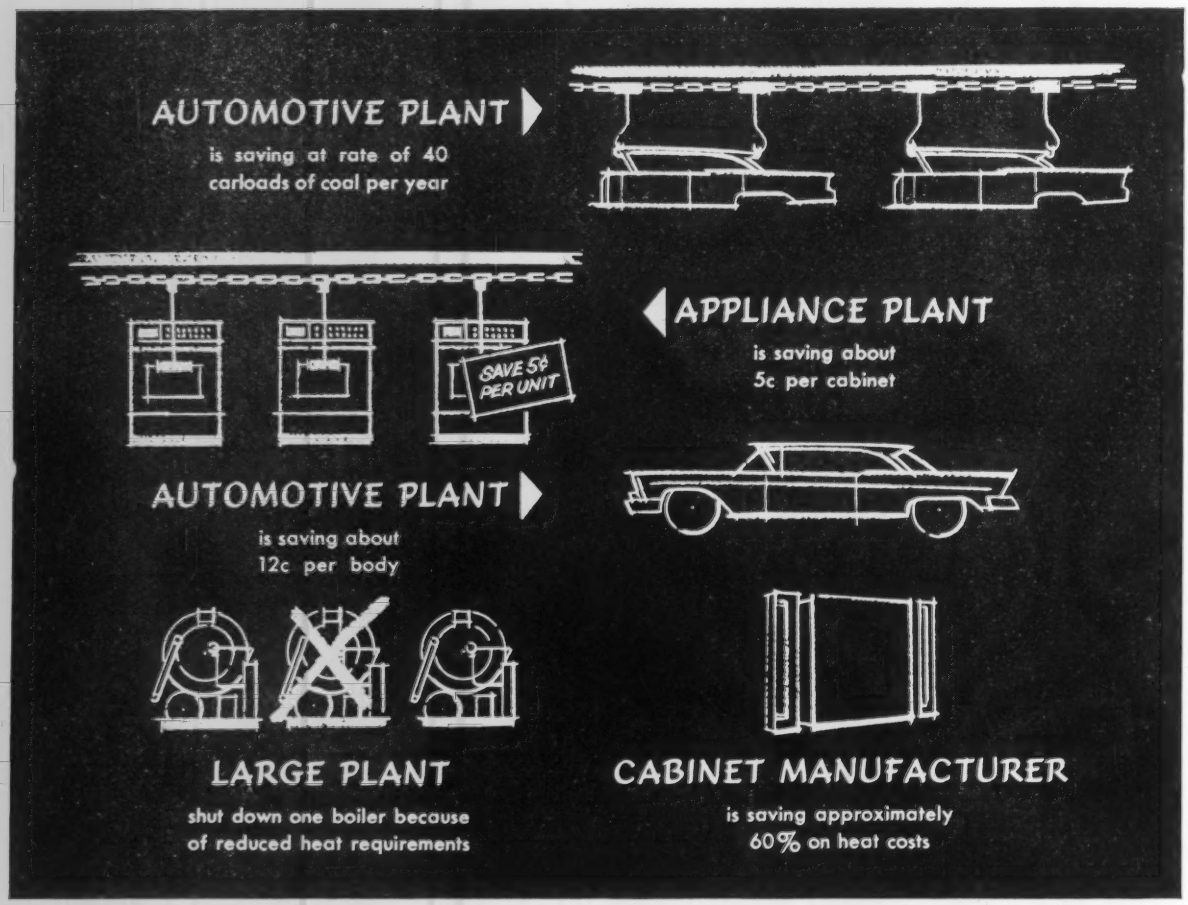

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Results produced by the Cold Bonderite System equal the highest Bonderite quality standards. Chemical costs are comparable to hot systems.

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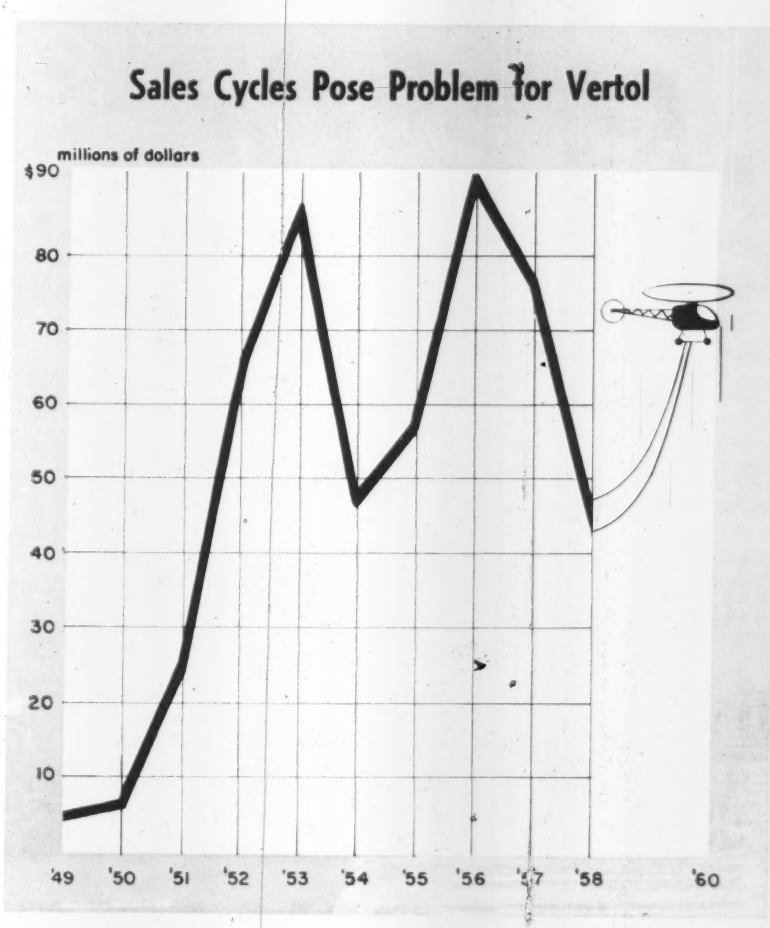


Research, New Products To Smooth Sales Slump

HOW can a firm iron out the peaks and valleys in its sales curve?

Vertol Aircraft Corp., Morton, Pa., faced the problem when its unfilled orders slipped from $117 million on Dec. 31, 1956, to $30 million on the final day of 1957. The solution: A broadened product line (Vertol designs and manufactures helicopters for military and commercial use) and increased participation in space age research projects.

• **Buys Boston Firm**—Vertol's first step was taken last March. It acquired Allied Research Associates Inc., Boston, for $750,000 in cash and 32,500 shares of stock. Purchase of the research and engineering firm strengthens Vertol's research arm.

The formation of a metalworking products group launched the firm into the space age. It does such things as study techniques of fabricating materials for space vehicles.

Vertol expects a steady advance in new government and commercial work to balance helicopter sales. The need for research is expected to grow, and some of the projects may lead to new commercial markets.

• **Ups and Downs**—Demand for helicopters has often been spectacular, occasionally disappointing, as the chart at left shows. Sales rose sharply between 1949 and 1953, dipped in 1954, rose again in 1955 and 1956.

Last year's net sales of $77.2 million weren't far behind the 1956 record total of $90 million, but sales for first nine months of this year fell to $29.6 million as government buying slowed down. Fourth quarter sales are estimated at $12 million to $15 million.

Company officials decided to move quickly into areas with long range growth prospects to boost sales, instead of waiting for the next move up on the roller coaster. (Government purchases of advanced helicopters are expected to gain in 1959, but the increases won't be reflected in company earnings until 1960.)

• **Another Problem**—Excessive ups and downs in sales tend to have a side effect: With plant skills not fully utilized, there's a danger that key technical talent will leave a company in slack periods, making it hard for a firm to take advantage of the next upswing.

As a countermeasure, Vertol plans to continue diversifving its interests while remaining in fields requiring a high degree of technological skills. It won't abandon its interests in government work. Research assignments in such fields as missiles require top level technical knowhow.

R&D Spending Is Climbing

Research budgets of U. S. industry are running ahead of last year's and will be even bigger in 1959, reports Dr. Philip Marvin, manager of the American Management Association's Research & Development Div.

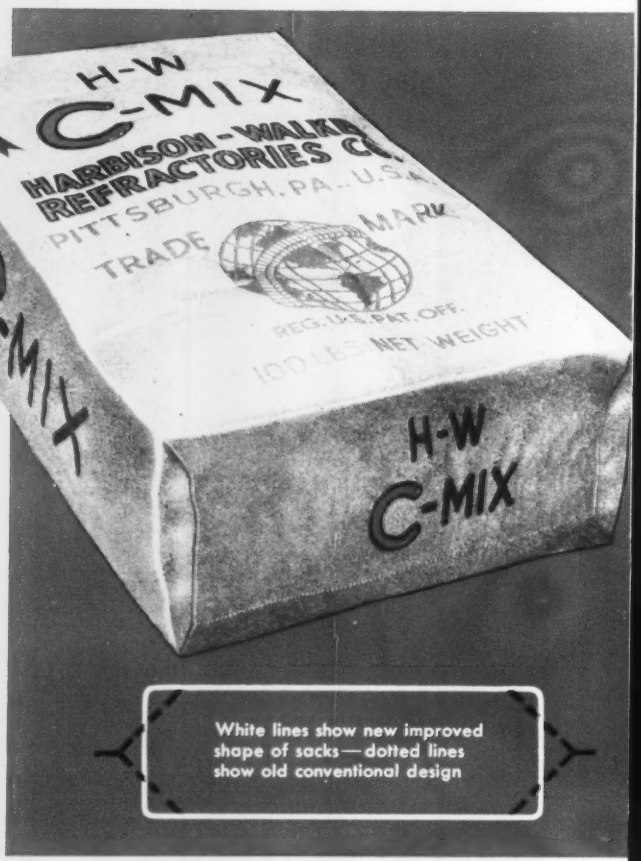
Speaking to an AMA seminar in New York, Dr. Marvin said that a survey of some 800 companies shows that 1958 budgeted expenditures for research are about 4 per cent above last year's. A later sampling of 15 per cent of the original respondents revealed that R&D budgets will be increased about 6 per cent in 1959, he added.

NOW...

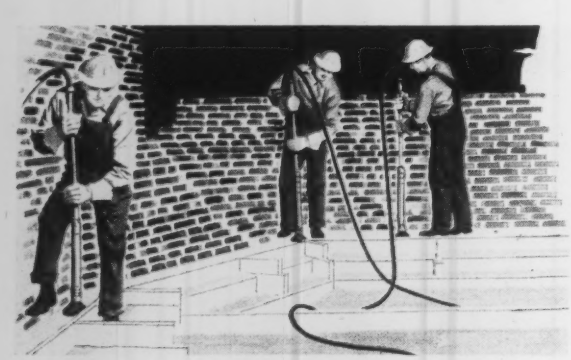
another added benefit...

square-end sacks facilitate handling and storage of Harbison-Walker

C-MIX and MAGNAMIX



H-W C-MIX (high purity seawater periclase) used for contour-rammed open hearth and electric furnace bottoms greatly reduces furnace downtime, saves labor and avoids burning-in sacrifice of refractory superstructure. And with its measurable margin of superior properties, costs are decidedly lower and furnace availability is greatly increased.



HIGH MAGNESIA CONTENT — Made from high purity seawater periclase with the magnesia content over 92%, H-W C-MIX best withstands the corrosive action of highly basic slags.

STABLE — It is fully converted to periclase and has excellent volume stability with negligible shrinkage at highest operating temperatures.

HYDRATION RESISTANT — H-W C-MIX is unique in its high degree of resistance to hydration.

STRONG — High strength over the entire range of steel furnace temperatures accounts for its excellent resistance to erosion.

DENSE — High density and low permeability retard penetration by molten metal and corrosive slags.

ECONOMICAL — H-W C-MIX provides the most durable monolithic hearths with low installation costs.

World's Most Complete Refractories Service

Palletizing and storage costs are lower with these sacks and they save space, avoid slippage and tear with reduced wastage. Brand shows on all sides for ease of identification.

RAMMING MIXTURES

H-W MAGNAMIX of 80% magnesia content stabilized as periclase, is made from dead-burned Washington magnesite. It is particle-sized to secure maximum density. While H-W MAGNAMIX is dependable for making new bottoms, it is especially adapted for bank maintenance, patching deep holes and repiping tapholes. It sinters into a hard dense monolith in a very short time at approximately 1000° F. lower than operating temperatures.

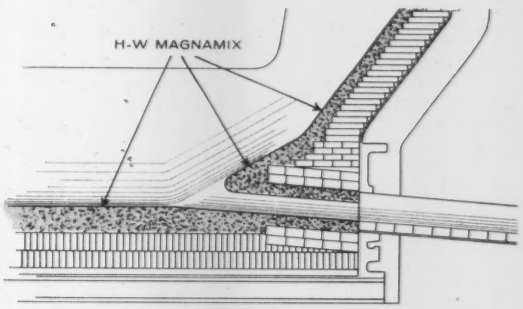
HIGH MAGNESIA CONTENT — It is used without the addition of slag or scale, thus avoiding dilution of its high magnesia content.

DENSE — As rammed into place, it becomes exceedingly dense and impermeable. When heated to operating temperatures, its density is further increased and a homogeneous monolith is formed.

STRONG — H-W MAGNAMIX has a strong cold set with the unusually high crushing strength of 1500 psi.

DURABLE — Its excellent resistance to erosion accounts for its splendid records and wide adoption in taphole service.

EASY TO USE — It has superior properties for patching large holes in banks and bottoms, and is applied by air-ramming, gun placement or by hand in hot patching.



CROSS-SECTION AT TAP HOLE

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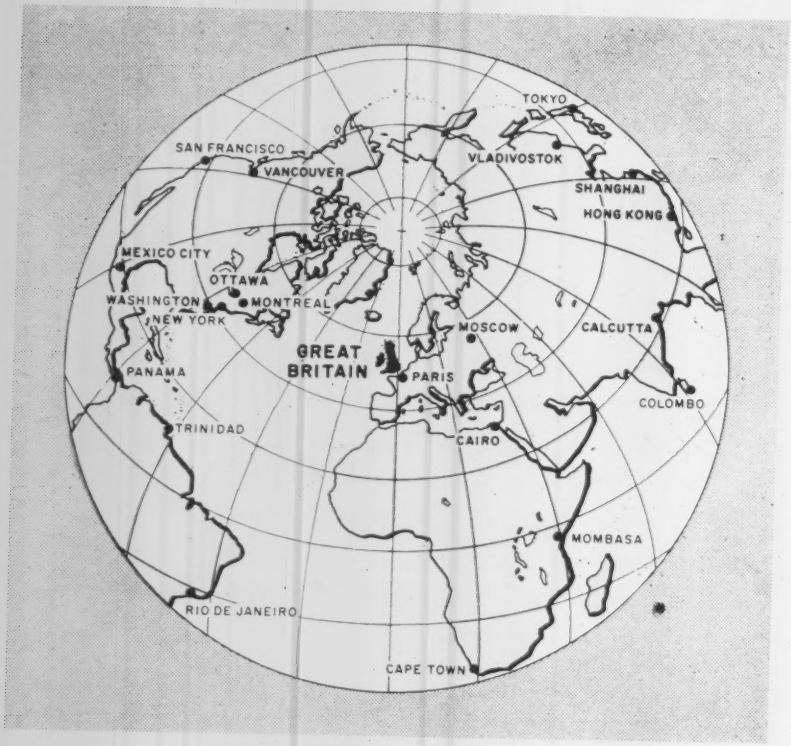
General Offices: Pittsburgh 22, Pennsylvania



Britain's centered location gives her a shipping advantage in trading

Britain Sees '59 Recovery

Industrialists think the business slump has touched bottom. Upturn is predicted. Autos are active, but publicly owned industries are still in doldrums

ENGLAND'S industrialists are looking to 1959 with hope even though slow markets and heavy inventories attest to the fact that the recession is not over in that part of the world.

They base their hope on the consensus of British economists that the bottom of the slump has been touched and that the beginning of recovery is near.

• **Production**—Steel output this year will probably be only about 21 million tons, compared with slightly over 24 million tons in 1957. Pig iron production, similarly, may just barely top 14 million tons, against last year's output of 16 million.

Deliveries of steel in the third quarter averaged 15 per cent lower than a year ago, with the decline coming in nearly all sections of the industry. There is no indication that fourth quarter shipments will speed up.

• **Problem Areas**—The auto industry has kept deliveries of strip mill sheets above last year's level, but that improvement is an exception.

Sharpest reductions have come in publicly owned industries (especially coal mining and railroads where consumption is off as much as 30 per cent). Shipbuilding and construction have also reduced buying. One brighter spot: Makers of heavy electrical equipment are taking more steel due to the tremendous expansion in construction of power stations in Europe.

British exports of steel have fallen more this year than domestic deliveries. As might be expected, imports have also plummeted. They're only about half what they were a year ago.

• **Plant and Equipment**—The British steel industry in 1958 spent about $280 million on modernization and improvements.

Two reasons are advanced for the expenditure: 1. The outlay was needed to increase efficiency and cut costs. 2. The steel industry is not nationalized and steelmakers don't want it to be. The industry would fight any such move, basing its resistance on its record of efficiency. Expenditures for new plant and equipment keep it defensible.

The British Iron & Steel Federation claims that public supervision (by a statutory board), the lowering of tariffs, and the Monopolies and Restrictive Practices Acts make difficult the establishment of any better defense. The federation adds that it's up to the critics to demonstrate advantages of nationalization, not up to the industry to defend the private owner system.

• **Shipbuilding** — Although British shipbuilders have enough work on hand to keep them busy for about four years, they're not happy.

Reasons: Orders for new ships have dropped from 7.7 million tons a year ago to about 6.6 million tons, with only about 10 per cent of that tonnage scheduled for export (the lowest percentage since 1946).

More disturbing is the fact that some 377,000 tons of new ships are being built in foreign yards for British owners—more than ever before. The reason for that echoes the complaint of many U. S. industrialists: Foreign shipbuilders' costs are so much lower, British manufacturers are finding it hard to compete. Example: By offering slightly lower prices, quicker delivery, and generous credit, the Japanese are rak-

ing in most available British orders for large tankers.

Output from British yards is about 330,000 tons per quarter. Don't look for much in the way of gains unless improved world trade comes quickly.

• **Autos**—The automotive industry has set a record pace in 1958, averaging about 20,000 cars a week of which around half have been exported (Great Britain exports about $1.5 billion worth of cars a year). The industry will earn about $200 million this year.

About 50 per cent of production goes to England, the rest of the Empire, and the Irish Republic. The U. S. takes 28 per cent, 16 per cent goes to Western Europe, and the remaining 6 per cent is scattered among other markets.

Commercial vehicle output is 4 per cent under last year's and exports have dropped 12 per cent. Production has averaged 5856 vehicles weekly.

The automotive outlook for next year is the brightest spot in British industry. Capacity production will continue in 1959 and exports to the U. S. will hold at least their present pace.

• **Machine Tools**—Recent new orders for machine tools have slowed the industry decline but not stopped it. Markets are slow and have shown only faint signs of making a comeback. The industry has some nine months' work on hand for exports and seven months' work for domestic use.

The industry's recession has hit hard at standard tools. Special tools have survived without harm.

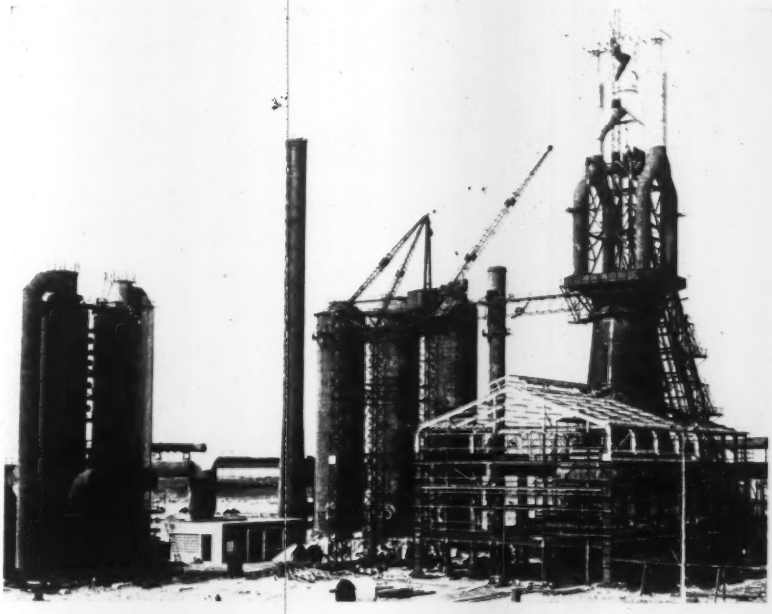
The industry has laid off about 3000 men since the beginning of the year. No significant improvement is expected before the second quarter of 1959.

• **Railroads**—Steel buying from railroads should improve early next spring. Most will be used for modernization. Some lines are being converted to electricity, and diesel engines are rapidly replacing steam locomotives.

Track laying should pick up when the weather breaks.

• **Competition**—It seems unlikely now that either a free trade area or a common market will become effective before the last half of next year. Britain must meanwhile keep exporting to meet a rising import account.

If Western Europe does become a free trade area, Germany will be the most important competitor for England. Belgium and the Netherlands will also provide strong competition.



NO. 5 BLAST FURNACE at Steel Co. of Wales's Morgan Works near Port Talbot, Wales, is nearing completion. With a 31-ft hearth, it is one of the world's largest. Rated capacity is 1500 tons per day

Satellites Could Speed Mail Delivery

EARTH SATELLITES to act as relay stations for electronic post offices could handle all first class mail between the U. S. and Europe at substantially lower cost and greater speed than conventional methods, says an RCA engineer.

The system was described to the American Rocket Society by Sidney Metzger, manager of communications engineering, Astro-Electronic Products Div. of RCA.

• **What It Means**—Here's how he says the system would work: Standard letter forms would be used (like V-mail forms in World War II). At major post offices, contents of letters would be converted to microwave signals. The impulses would be transmitted from a special ground station to a similar station overseas. A satellite repeating station fixed in space at a longitude midway between the two continents would relay the signals.

When the message was received in Europe, the signals would be transmitted to the appropriate post office for electronic reconversion to letter form.

• **Advantages**—Mr. Metzger claims cost would be about 12 to 15 cents per letter, compared with present first class overseas mail costs of 8 cents for the first ounce and 5 cents for each additional ounce.

Delivery time would drop from the present average of about 10 days to a maximum of two and one-half days, Mr. Metzger estimates.

• **It's Practical**—The RCA engineer stresses that the idea is based on known electronic techniques. The satellite repeating station "would weigh several hundred pounds and could be launched by an Atlas or Titan plus upper stages."

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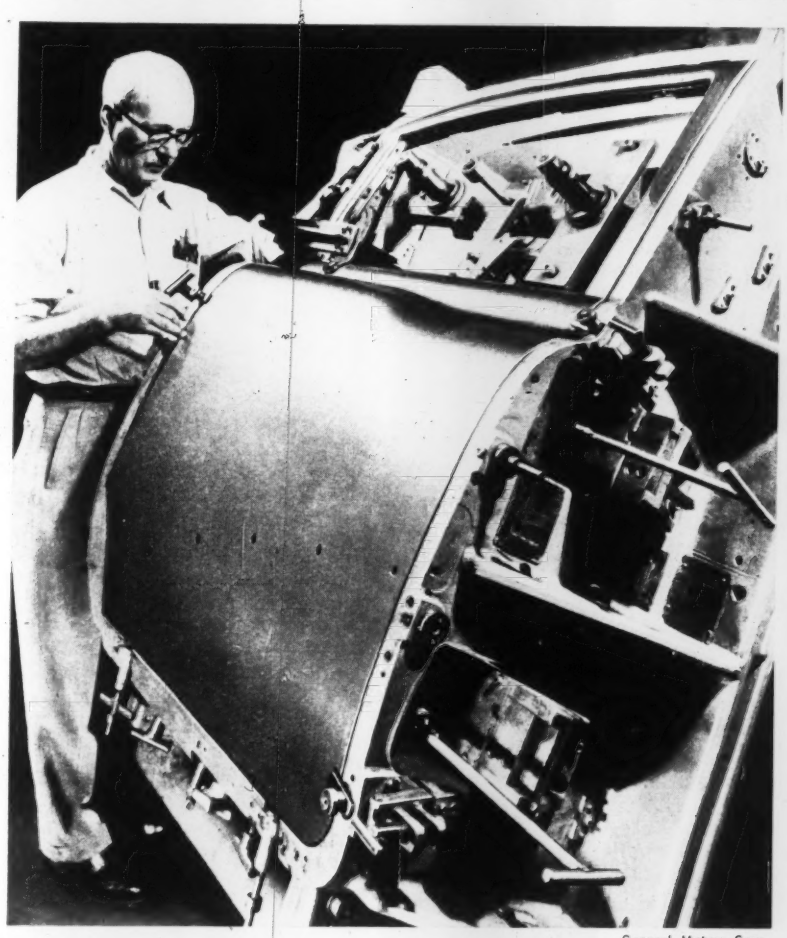

General Motors Corp.

The heyday of the independent tool and die shop in autodom's capital is over. Decentralization and competition from captive and foreign shops have pushed jobbers to point of no return

Detroit Tool Shops Fight for Lives

INDEPENDENT tool and die shops in the Detroit area are seeking a one-year extension of their contracts with the United Auto Workers. It would reduce the wage advantage of captive shops over job shops from around 45 to an average of 35 cents an hour. (The Big Three auto plants gave skilled workers an 8 cent wage boost, plus fringes, this year.)

But the extension would only postpone a problem that has no clearcut solution. In the last 12 years, jobbers have watched tooling contracts go to integrated captive shops; then out of state as automakers decentralized; then overseas (where skilled workers get 65 to 70 cents an hour, instead of the $3.52 that's average in Detroit).

Now the shops are facing an even tighter squeeze as carbuilders switch to interchangeable body components which require less tooling. Growing interest in plastic tooling poses a threat to shops not equipped for it.

• **Background** — Carmakers once paid premiums for independent craftsmen's ability to solve production problems. Lately they have been switching emphasis, paring production expenses and giving marketing people a freer rein. Result: Captive tool and die shops grew and independents' troubles began.

Not all automakers agree that captives are taking more business. Says GM's Fisher Body Div.: "Outside purchases for die, jig, and fixture construction in Fisher Body Div. have steadily increased during the last decade, in years when major body style changes have occurred. In 1949, about 18 per cent of all Fisher die and fixture work was jobbed. In the 1959 body program, about 33.5 per cent will be done by outside firms—and there is now about 2½ times as much die and fixture work."

• **Decentralization**—In any event, a lower percentage is going to Michigan jobbers. To meet rising transportation and labor costs, automakers have been spreading out. Assembly and partmaking plants have sprung up in Ohio, Indiana, California, and other states. Each plant has its local suppliers. Labor rates often are lower: In Toledo, Ohio, tool and die men get 60 cents less than they do in Detroit. In Nashville, Tenn., the difference is $1.10.

In 1946, the Automotive Tool & Die Association, Detroit, estimated that 80 per cent of all automotive tooling was placed in the Detroit area. Now the association figures the whole state of Michigan accounts for only 34 per cent. Ohio gets 17 per cent; Illinois gets 8; Indiana, New York, and California take 6; Massachusetts, Pennsylvania, and New Jersey split 12 per cent.

• **Foreign Tooling** — Another com-

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Beat-the-Experts Contest

"Nearly 800 STEEL readers have entered the Beat-the-Experts contest," reports our Beat-the-Experts editor. Guesses range from less than 2 million to more than 4 million. Here's how you can join in the fun:

The forecaster who most nearly pegs the number of cars to be built in the U. S. from Jan. 1 through June 30, 1959, will win a scale model of General Motors' Firebird III. Ten runners-up will get full color prints of a dream car rendered by George Walker, Ford's vice president and director of styling.

I believe _____ automobiles will be produced in the U. S. during the first six months of 1959.

Mail this to:

Beat-the-Experts Editor
STEEL
Penton Bldg.
Cleveland 13, Ohio

PRINT NAME _____
POSITION _____
COMPANY _____
ADDRESS _____
CITY _____
STATE _____

petitor threatens not only the Detroit jobbers, but all independent tool and die firms.

General Motors Corp. and Ford Motor Co. have made money on foreign investments in the last few years. The profits can't be turned into American dollars because of trade restrictions. To use up some of the profits and take advantage of low labor rates, they have been buying some tooling in Europe.

• **Quantity Questioned**—Just how much is being purchased overseas is debatable. Auto company executives privately admit that orders have been placed in Germany, Switzerland, and England. They also quickly point out that the costs and problems associated with shipping and final fitting of tools and dies tend to overshadow any cost advantages from low labor rates.

The U. S. Commerce Department claims only 4 per cent of all tooling used in this country is imported, but the department's statistics don't indicate how much of it is for automotive use.

The National Tool & Die Manufacturers Association, Cleveland, has submitted a recommendation to the Tariff Commission, asking that import classifications be revised so the amount of imported tooling can be determined.

Union leaders have taken another approach. The UAW is seeking a Congressional investigation to find out how much foreign tooling is bought by carbuilders.

The issue still is cloudy. Says Howard Maynard, president, Snyder Corp., Detroit machine tool builder: "I went all over Europe this spring asking about tooling contracts, and to the best of my knowledge, there were practically none at that time."

Best guesses from the industry place the amount of imported tooling at 7 to 10 per cent. There's little likelihood that it will increase. It may diminish as European tool shops push to meet increased demand when the common market gets underway next year.

• **Precarious Position** — But automotive tooling job shops (especially Michigan's) see nothing but lean years ahead. There are perhaps 180 first rate tooling shops in the Detroit area. There are another 800 smaller firms. Failures have been averaging two a week, claim local newspapers.

Next year looks no better. Tooling contracts are late. There will be little work coming from GM. Captive plants, with heavy capital equipment investments, will get even more contracts. So will out-of-state shops.

• **Solutions**—What can the jobbers do? There are only a few courses of action. None is guaranteed to work for all firms, but each has been tried by one or more of the Detroit area shops.

1. Firms that can afford it should try to integrate manufacturing operations so they can better control finished costs. This will provide a realistic basis on which to quote.

2. Smaller shops might be able to make a go of it by concentrating on one or two types of specialty tools that can be semi mass produced to keep costs down. The job calls for a sales and development staff that can sell carbuilders on the need for specialty tools of this type.

3. Sales staffs must solicit business from nonautomotive accounts. Missiles, appliances, furniture, and sporting goods are likely fields.

4. As a last resort, smaller shops can consider mergers. Firms with more capital can move out of the state to locations where labor is cheaper and state taxes tend to favor small businesses.

U. S. Auto Output

Passenger Only

	1958	1957
January	489,357	641,591
February	392,112	570,650
March	357,049	578,356
April	316,503	548,656
May	349,474	531,413
June	337,355	500,266
July	321,053	495,625
August	180,324	525,363
September	130,426	283,862
October	261,696	327,362
10 Mo. Total	3,135,349	5,003,144
November	.....	578,600
December	.....	534,714
Total	.....	6,115,458

Week Ended	1958	1957
Oct. 25	70,973	104,987
Nov. 1	97,804	126,139
Nov. 8	125,279	136,742
Nov. 15	117,688	141,904
Nov. 22	138,727	151,846
Nov. 29	122,803	114,795
Dec. 6	147,000	139,506

Source: *Ward's Automotive Reports*. [1]Preliminary. [2]Estimated by STEEL.

N/D CASE HISTORIES

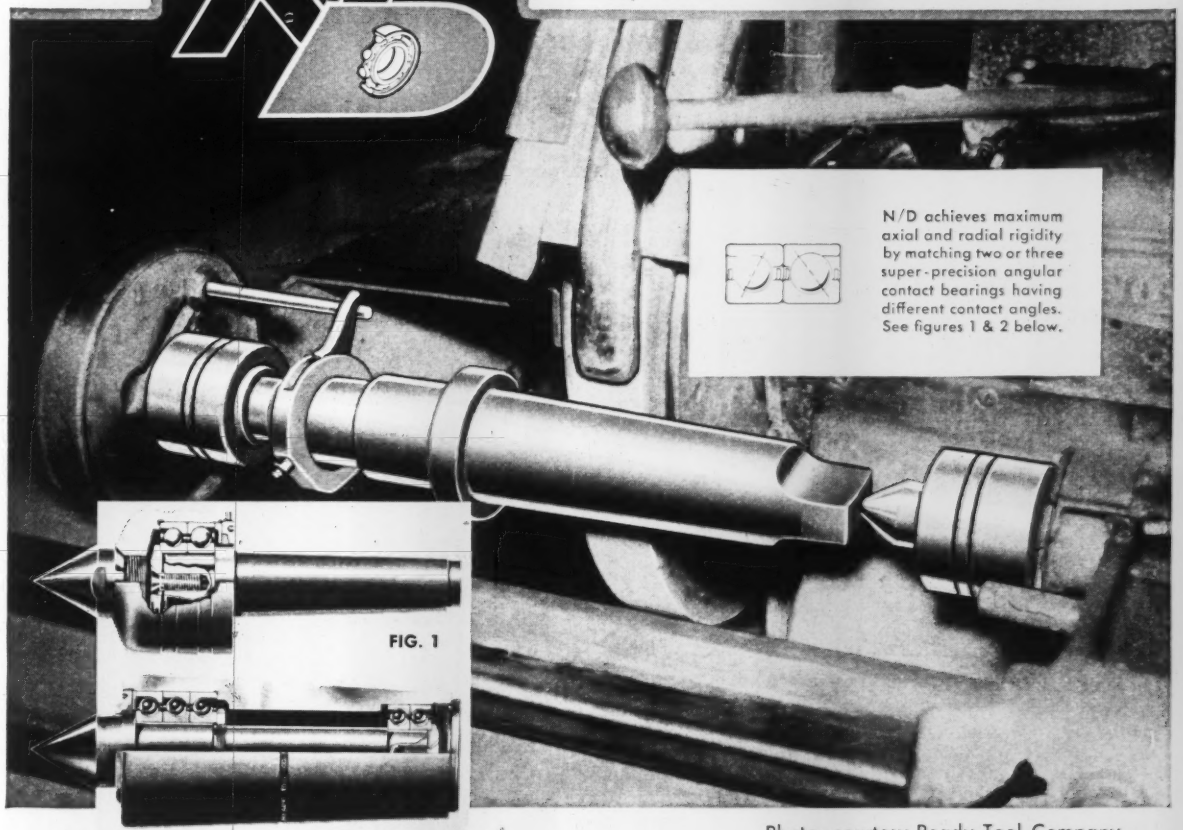
N/D achieves maximum axial and radial rigidity by matching two or three super-precision angular contact bearings having different contact angles. See figures 1 & 2 below.
FIG. 1
FIG. 2

Photo: courtesy Ready Tool Company

N/D Bearing Design Helps Live Center Maker Achieve Accuracy of .000050"!

CUSTOMER PROBLEM:

Live center maker requires bearing design that will help achieve . . . and maintain . . . live center accuracy of .000050", under combination radial and thrust loads.

SOLUTION:

After thorough evaluation of the problem, New Departure recommended N/D pre-loaded, duplex ball bearings. Extensive testing proved these super-precise ball bearings resisted combination radial and thrust loads with minimum deflection. The N/D ball bearings, with medium and high contact angles, are mounted duplex and positively clamped together to assure the optimum, pre-determined preload condition. As work expansion increases the thrust load, radial centering becomes more rigid and accuracy is precisely maintained . . . to less than .000050" total indicator run-out!

When you're working on new designs that call for high precision ball bearings, why not call on New Departure? New Departure's consistent precision is your assurance of the ultimate in accuracy for your design. For more information, call the New Departure Sales Engineer in your area or write Dept. T-12.

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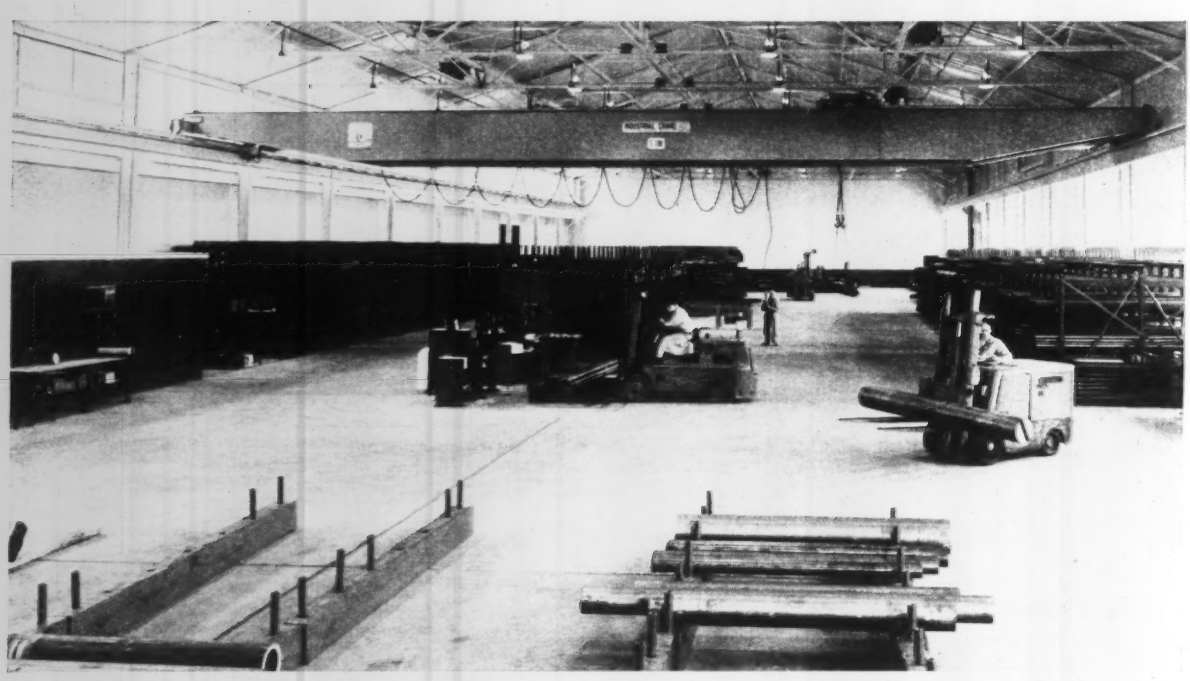

NOW you can get shipments with more speed than ever before because our new warehouse for Timken® graphitic tool steels and 52100 tubing has speed built in. Here's how the new warehouse helps you:

WITHIN 24 HOURS of the time we get your order, we can have the material on its way to you with the help of ultra-modern handling equipment and methods.

FEWER DELAYS EN ROUTE. We built our new warehouse on main railroad and truck routes in Canton, Ohio, for faster shipping.

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Now, more than ever, when you want these steels fast, phone or write your order to The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable: "TIMROSCO". Tapered Roller Bearings, Alloy Steels and Seamless Steel Tubing, Removable Rock Bits.

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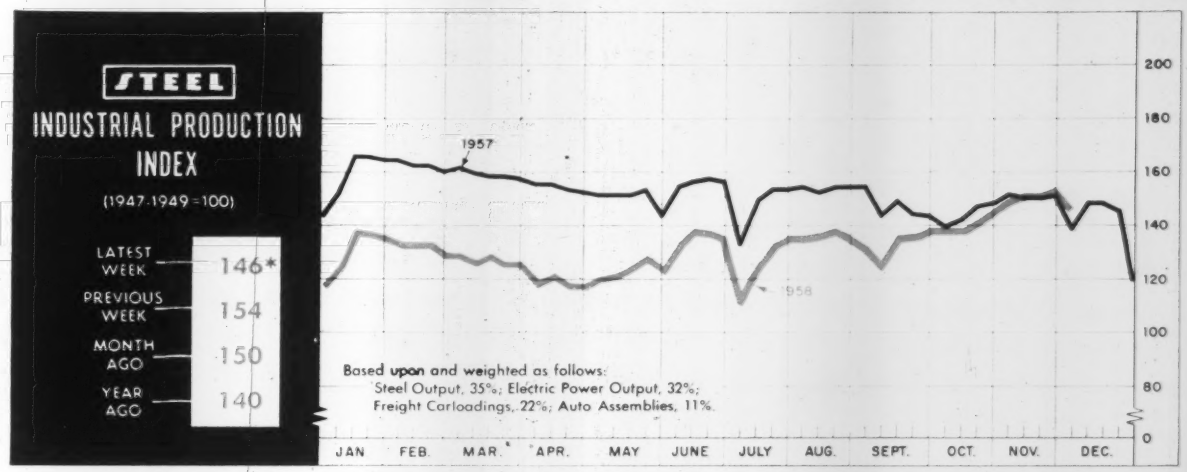
SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS STEEL TUBING



*Week ended Nov. 29.

Consumers Optimistic but Cautious

CONSUMER SPENDING is going to be one of the most important elements in the recovery during 1959 just as it was in 1954. But inflation fears will hold back many buyers.

That's the obvious conclusion to be drawn from the most recent (October) University of Michigan study on consumer attitudes and inclinations to buy. Optimism has returned, but with reservations. Economic conditions are clearly better now than they were in June when the last survey was made, but in comparison with the October, 1954, survey, consumers are not quite as confident or as willing to commit themselves on future purchases.

• **Leaves Scar** — Recession fears have not completely vanished. Consumers show greater intention to buy durable goods than they did in June, but their intentions are still below the relatively low level expressed in the November-December survey last year. Such thinking was especially true for autos. (The survey was made before the general introduction of 1959 models.) But the attitude toward house buying and major household goods purchasing was somewhat better.

Optimism has recovered faster than intentions to buy, the survey reveals—a good sign because experience shows that purchases usually surpass intentions under such conditions.

• **Favorable Signs** — The continuing rise in personal income, combined with the change in attitudes for the better, should increase consumer spending for durable goods. Equally significant is the above-average improvement in the business attitude of the group with annual incomes of $5000 or more. This group includes over 40 per cent of all families and an even greater percentage of the buying power.

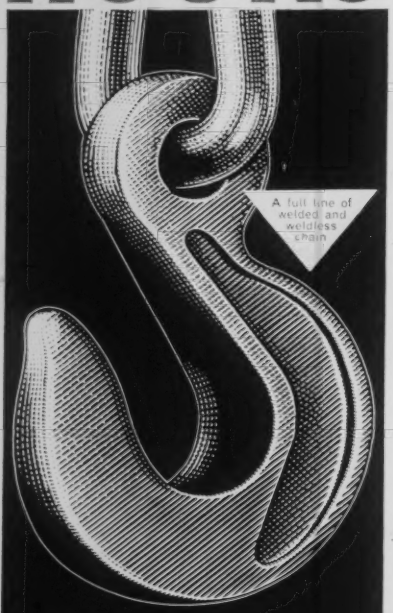
Long range optimism concerning personal financial matters has

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1000 net tons)[2]	2,013[1]	1,988	1,831
Electric Power Distributed (million kw-hr)	12,050[1]	12,579	11,613
Bituminous Coal Output (1000 tons)	8,750[1]	8,585	9,593
Crude Oil Production (daily avg—1000 bbl)	6,950[1]	6,975	6,829
Construction Volume (*ENR*—millions)	$273.0	$243.0	$378.7
Auto, Truck Output, U. S., Canada (*Ward's*)	151,941[1]	171,967	142,241
TRADE			
Freight Carloadings (1000 cars)	543[1]	619	554
Business Failures (Dun & Bradstreet)	260	274	308
Currency in Circulation (millions)[3]	$31,750[1]	$31,754	$31,431
Dept. Store Sales (changes from year ago)[3]	+2%	+3%	+4%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$23,231	$25,396	$23,600
Federal Gross Debt (billions)	$283.5	$280.2	$273.8
Bond Volume, NYSE (millions)	$27.7	$33.3	$20.7
Stocks Sales, NYSE (thousands of shares)	16,941	20,714	12,316
Loans and Investments (billions)[4]	$93.8	$93.7	$86.3
U. S. Govt. Obligations Held (billions)[4]	$31.3	$31.3	$24.9
PRICES			
STEEL's Finished Steel Price Index[5]	247.82	247.82	239.15
STEEL's Nonferrous Metal Price Index[6]	217.5	217.5	205.7
All Commodities[7]	119.1[1]	119.1	117.8
Commodities Other than Farm & Foods[7]	126.7[1]	126.8	125.6

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1958, 2,699,173; 1957, 2,559,490. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-39=100. [6]1936-39=100. [7]Bureau of Labor Statistics Index, 1947-49=100.

PATENTED
TAYCO HOOKS



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Pat. No. 2646306

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Hammond, Indiana
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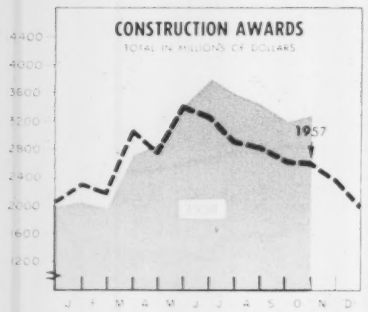
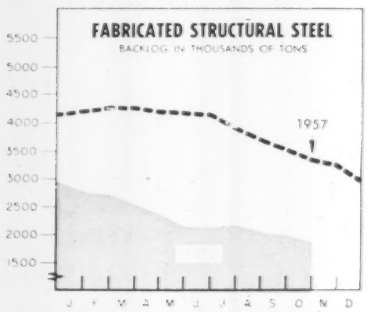
Taylor Made CHAIN SINCE 1873

THE BUSINESS TREND





	Total		Building	
	1958	1957	1958	1957
Jan.	2,066.1	2,299.6	1,536.2	1,730.7
Feb.	1,953.4	2,161.0	1,478.1	1,695.5
Mar.	2,721.2	3,078.0	2,037.7	2,199.7
Apr.	2,881.0	2,776.4	2,198.0	2,069.7
May	3,402.6	3,399.5	2,470.3	2,416.8
June	3,819.6	3,243.5	2,340.3	2,341.5
July	3,607.1	2,900.7	2,633.5	2,247.6
Aug.	3,466.6	2,818.0	2,529.5	2,291.8
Sept.	3,215.9	2,624.9	2,352.5	2,092.2
Oct.	3,309.0	2,613.8	2,549.8	2,075.6
Nov.	.....	2,370.7	.....	1,808.5
Dec.	.....	1,982.3	.....	1,457.5
Totals	.....	32,268.4	.....	24,427.1

F. W. Dodge Corp.
Charts copyright, 1958, STEEL.

	Shipments		Backlogs	
	1958	1957	1958	1957
Jan.	316.7	290.1	2,778	4,194
Feb.	282.6	319.0	2,727	4,262
Mar.	336.6	342.4	2,542	4,245
Apr.	323.6	362.2	2,387	4,192
May	328.2	377.3	2,211	4,172
June	329.2	384.7	2,191	4,134
July	290.9	342.5	2,220	3,907
Aug.	298.0	383.8	2,119	3,707
Sept.	313.7	338.6	2,047	3,521
Oct.	307.1	384.8	1,913	3,322
Nov.	.....	334.1	.....	3,233
Dec.	.....	320.2	.....	2,959
Total	.....	4,179.7		

American Institute of Steel Construction

changed little in the last few years and practically not at all since last June. This has been the area least affected by recessions.

• **Biggest Disappointment** — The biggest deterrent to a vigorous recovery in 1959, say the pollsters, is resistance to higher prices. In June, only 28 per cent of those questioned thought prices would rise over the next year. The opinion seemed to be that a recession and rising prices were incompatible. But after several months of increased living costs, the opinion has changed sharply. Now 43 per cent think prices will go up in the next year. And as many people now as in 1956 and 1957 think the long range trend is up.

The surveyors conclude: "Apparently, consumers are not in a mood to go on a spending spree. They must be persuaded to buy products which are judged to be attractive and serviceable, offered at prices which are thought to be 'right'."

Sees GNP at $475 Billion

In the opinion of Dr. Gordon W. McKinley, economist for the Prudential Insurance Co. of America, the consumer is going to go on that spending spree and lead the nation to new highs in 1959. He forecasts a record gross national product of $475 billion next year, which would not only set a record but also represent one of the largest year-to-year increases in the history of this statistical series. The estimated annual rate for 1957 is about $435.5 billion.

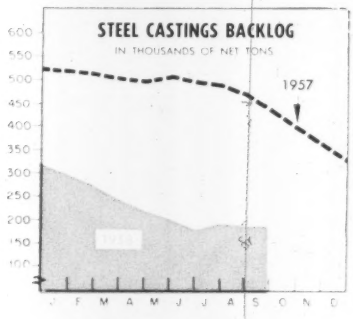
Consumer spending will account for the biggest increase, rising $16 billion above the 1958 level to $307 billion. Plant and equipment spending will increase by another $2 billion. The shift from inventory depletion to accumulation will tack another $7.5 billion onto the total. Federal, state, and local government spending will increase $8.5 billion, and private housing starts —at 1,150,000 units—will add another $1 billion to GNP.

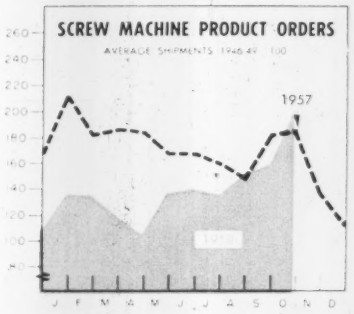
Employment will increase by 1.6 million, Dr. McKinley prophesies. That will be sufficient to absorb the increase in the labor force and reduce unemployment to normal levels by the end of the year.

But such activity will bring the threat of inflation, he warns.

Building Total Zooms

The other element that is ex-





	Shipments 1958	Shipments 1957	Unfilled Orders* 1958	Unfilled Orders* 1957
Jan.	120.7	169.2	304.9	519.6
Feb.	103.3	154.9	282.4	511.8
Mar.	106.2	160.1	252.8	503.4
Apr.	91.5	162.5	229.5	497.6
May	87.0	164.6	211.3	505.0
June	92.9	153.6	190.8	494.3
July	68.8	122.0	200.3	489.4
Aug.	80.9	145.9	196.3	471.2
Sept.	85.3	139.0	196.5	438.5
Oct.	...	146.4	...	395.9
Nov.	...	127.1	...	362.9
Dec.	...	120.8	...	327.3
Total	...	1,766.1		

*For sale. U. S. Bureau of the Census

	New Orders 1958	New Orders 1957	Shipments 1958	Shipments 1957
Jan.	138	211	165	206
Feb.	137	181	145	185
Mar.	122	185	141	197
Apr.	108	183	141	193
May	139	167	134	192
June	142	166	133	173
July	138	159	124	139
Aug.	154	147	142	173
Sept.	161	181	151	168
Oct.	201	184	182	184
Nov.	...	135	...	159
Dec.	...	110	...	144
Avg.	...	167	...	176

National Screw Machine Products Assn.

pected to be a major strength in 1959—construction—is still breaking records. But there are signs of weakening which should not be overlooked in evaluating the longer term.

F. W. Dodge Corp. reports that construction contracts in October hit a new high for the month and marked the sixth consecutive month in which a record has been set. Contracts soared to $3,309,024,000 in October, the first time the $3 billion level has been reached for the month. (See graph and table, Page 86.)

October also was the fifth consecutive month in which bookings for fabricated structural steel exceeded the corresponding year-ago figures, reports the American Institute of Steel Construction Inc. The total (259,016 tons) was the best since July. But bookings are still behind shipments, which reached 307,080 tons in October (see table, Page 86).

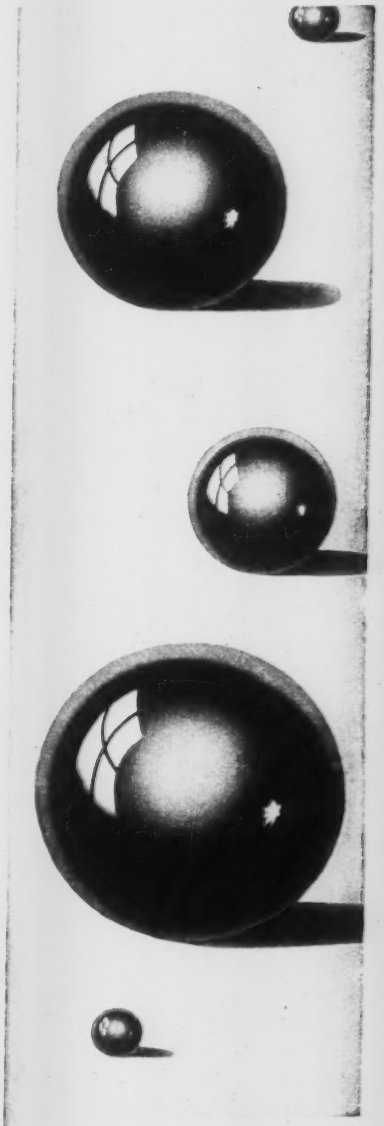
The sour note comes from weekly heavy construction awards compiled by *Engineering News-Record*. On a cumulative basis, they are now only 5 per cent ahead of the corresponding 1957 period. During most of the summer, the gap was 7 or 8 per cent. Five of the last seven weeks have found the 1958 totals below the corresponding 1957 figures.

Index To Rebound

Look for STEEL's industrial production index to bounce all the way back to the pre-Thanksgiving level during the first week of December, then go on to establish successive high points for 1958 in the next two weeks.

The index dropped 5 per cent over the holiday week, which is about average for the last five years. The decline matched the performance of the index in 1954. There is good reason to believe that the parallelism will continue, which would mean the return of the trend line to at least the year's high of 154 (1947-49 = 100) during the week ended Dec. 6.

For the last three weeks of record, the production index has held above the year-ago level. Output of electric energy, auto production, and steel operations have contributed about equally to this gain. And even though freight carloadings are still lagging behind the 1957 pace, the gap has narrowed to about 2 per cent within recent weeks.



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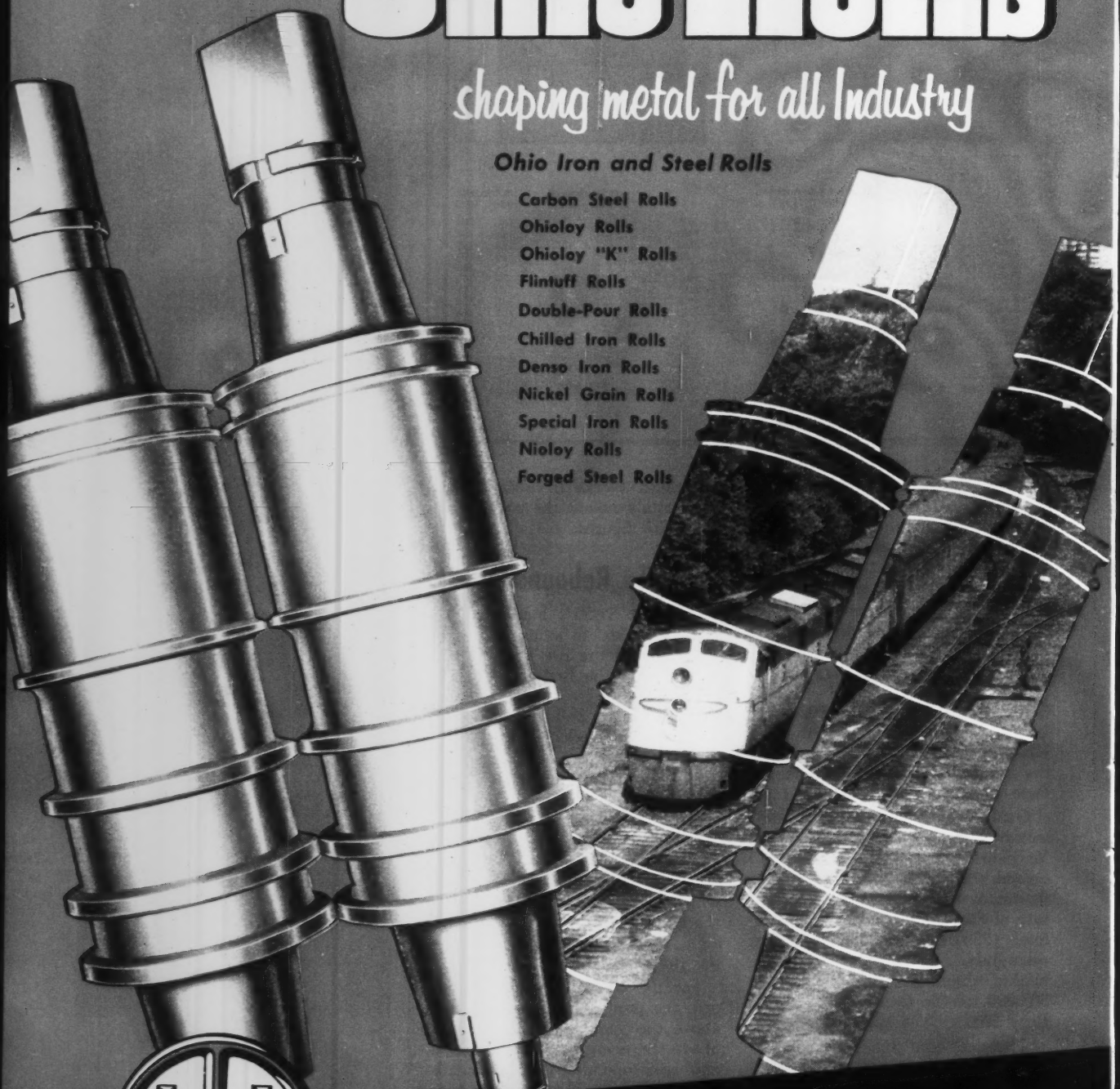
- Denso Iron Rolls
- Nickel Grain Rolls
- Special Iron Rolls
- Nioloy Rolls
- Forged Steel Rolls



THE OHIO STEEL FOUNDRY CO.

LIMA, OHIO — Plants at Lima and Springfield, Ohio

LIMA... Virtually at the center of the steel industry

OR22

LEE P. THOMAS
Peerless Equipment president

ROBERT W. JORDAN
Hamilton Foundry v. p.

JOHN C. WALLACE
Walworth v. p.-gen. mgr.

RICHARD H. DeMOTT
Acheson Mfg. president

Lee P. Thomas was elected president, **Peerless Equipment Div.**, Poor & Co., Chicago. He succeeds the late **Norman T. Olsen.** Mr. Thomas was vice president.

Walter L. Smith, vice president-operations, was appointed assistant to the president of **Chase Brass & Copper Co. Inc.**, Waterbury, Conn., subsidiary of Kennecott Copper Corp. He is succeeded by **Gilbert R. Boutin,** former works manager of Chase Metal Works.

Robert W. Jordan was elected vice president, **Hamilton Foundry & Machine Co.**, Hamilton, Ohio. He was assistant vice president.

Robert F. Hodgson was appointed general sales manager, **Hydreco Div.**, Kalamazoo, Mich., New York Air Brake Co., effective Jan. 1. He will replace **E. J. Hrdlicka,** resigned. Mr. Hodgson was manager of engineering for the division.

J. Paul Maddox fills the new post of manager of market research and development at **Mexico Refractories Co.**, Mexico, Mo. He previously acted as special representative, coordinating Mex-R-Co sales to the refinery industry and engineering firms.

Edmond D. Pieri was appointed manager, new product development, **Stran-Steel Corp.**, Detroit, a division of National Steel Corp. He continues as manager, sales engineering.

James Flett Organization Inc., Chicago, appointed **Robert J. Wilson** assistant to the chairman.

John C. Wallace was appointed vice president and general manager of **Walworth Co.**, New York. He is in charge of manufacturing, engineering, sales, and research and development. Mr. Wallace was vice president-operations. He joined the company in 1957 as vice president-manufacturing. He previously was vice president and general manager at Hunt Spiller Mfg. Corp.

Alfred F. Johnson was appointed assistant chief engineer of **Walworth Co.**, New York. He formerly served the forge and fittings division of H. K. Porter Company Inc. as chief engineer and works manager.

Irvin R. Spangler was appointed sales manager, machine and tools division, **Michigan Tool Co.**, Detroit. Former assistant sales manager, he succeeds **Paul F. Zerkle,** who continues with the firm on special assignments.

Charles H. Mawhinney was promoted to assistant to vice president-commercial, **Jessop Steel Co.**, Washington, Pa.

Henry S. Black was appointed director, **DataTape Div.**, Pasadena, Calif., Consolidated Electrodynamics Corp. He succeeds **Philias H. Girouard,** recently named development co-ordinator for the firm.

Dr. Joseph F. Manildi was made general manager, **Thompson Ramo Wooldridge Products Co.**, Los Angeles, now a division of Thompson Ramo Wooldridge Inc. The division specializes in industrial control and data reduction systems.

Richard H. DeMott was named president and general manager of **Acheson Mfg. Co.**, Rankin, Pa. He succeeds **George R. Acheson Jr.** as president. A former chairman and president of SKF Industries Inc., he retired from its management last year to become a vice president of H. B. Maynard & Co., Pittsburgh management consultants. He remains in an advisory capacity to this firm.

E. William Place joined **Holex Inc.**, Hollister, Calif., as vice president and chief engineer. He was manager, missile products division, Beckman & Whitley Inc.

Charles A. Naegeli Jr. was made chief engineer for propellent-actuated devices of the missile products division of **Beckman & Whitley Inc.**, San Carlos, Calif. He was with Grumann Aircraft.

Robert S. Meighen was appointed vice president-sales, **Weirton Steel Co.**, division of National Steel Corp., Weirton, W. Va., effective Jan. 1. Vice President **Lee D. Brueckel,** who has served more than 50 years with the company, will retire at that time.

John D. Saint-Amour, president of **Metronix Inc.**, Chesterland, Ohio, has also assumed the duties of sales manager of the firm, a subsidiary of **Assembly Products Inc.** A new regional sales office, headed by **Lloyd Rowe,** wes established in Philadelphia by Assembly Products.

Walter H. Babbitt Jr. succeeds **Charles Potter,** retired, as manager

JAMES P. W. DAVIDSON
Saco-Lowell business dev.

CARLISLE R. SLATER
Nat'l Malleable works mgr.

LOUIS A. SACHA
joins Milbar Corp.

WILLIAM T. BURNS
Kaiser Chemicals works mgr.

of the Pittsburgh warehouse, **Jones & Laughlin Steel Corp.**

Saco-Lowell Shops, Boston, promoted **James P. W. Davidson** to director of business development. He will explore potential new products for manufacture or development, and locate and examine other business concerns for possible acquisition. He formerly headed the company's defense, automotive, and agricultural sales activities.

Robert M. Kilgore was promoted from assistant district manager to district sales manager, New York office, **National Steel Corp.** He succeeds the late **R. B. Sanders.**

Peter M. Sarraiocco was promoted to secretary to the management advisory committee of **National-U. S. Radiator Corp.,** Johnstown, Pa.

M. W. Kostich was made west coast branch manager for **Huck Mfg. Co.,** Los Angeles. He replaces **R. A. Villacres,** recently made western division sales manager.

Alex W. Callam was promoted from assistant vice president to vice president of export requirements of **Radioplane,** a division of Northrop Aircraft Inc., Van Nuys, Calif.

Edward P. Tagge was appointed to the new post of general auditor of **Beckman Instruments Inc.,** Los Angeles; and **Robert A. Lineberger** to controller of its Helipot and Scientific & Process Instruments divisions, Fullerton, Calif.

Robert H. Schwindler was made manager of the newly formed western division of **Designers for Industry Inc.** at Arcadia, Calif.

Carlisle R. Slater, since 1954 general superintendent of the Melrose Park, Ill., Works of **National Malleable & Steel Castings Co.,** was promoted to manager. Associated with the company since 1933, he transferred from the Cleveland Works to the Melrose Park plant in 1942.

Louis A. Sacha joined **Milbar Corp.,** Cleveland, as director of engineering and production. He was vice president and sales manager for East Shore Machine Products Co.

Harold K. Hatfield was made western regional sales manager, **Kaylock Div.,** Rivera, Calif., Kaynar Mfg. Co. Inc. **Victor Hassell,** recently named eastern regional sales manager for the division, has taken over his new duties in Wichita, Kans., site of one of the Kaynar warehouses.

Gilbert H. Van Schaik succeeds **R. S. Hammond,** retired, as manager of the Chicago district office of **Whiting Corp. Harrison Taylor** was made manager, St. Louis district office, succeeding **Frank P. Walsh,** retired.

A. B. Pollock was named general plant manager, manufacturing, television and radio Victrola production unit, **Radio Corp. of America,** New York. Formerly plant manager of RCA's Bloomington, Ind., television manufacturing plant, he is now responsible for production administration and manufacturing at RCA Victor's six plants. **J. B. Davidson** was made manager, purchasing and production control, for the new unit, with **E. E. Smallwood** serving as administrator, manufacturing studies and controls.

William T. Burns was appointed works manager of Kaiser Aluminum & Chemical Corp.'s Moss Landing, Calif., plants, **Kaiser Chemicals Div.** He succeeds **D. M. Kerr,** retired. Mr. Burns was assistant works manager.

William L. MacMichael was made manager of a new card manufacturing plant for the supplies division of **International Business Machines Corp.** It is under construction at Concord, Mass. He was manager of manufacturing plans and controls of the division at Endicott, N. Y.

Russell N. Keppel, former director and vice president-marketing for Esso Standard Oil Co., joined **Prufcoat Laboratories Inc.,** Cambridge, Mass., as vice president. He will be at the New York sales office.

Paul F. Matheny was appointed supervisor of systems projects in **Crucible Steel Co. of America's** systems and procedures department, Pittsburgh.

L. M. Littman was made manager of distributor and engineering product sales in New York for **Allis-Chalmers International.**

I. G. Kepner was made Pacific Coast region manager at San Francisco for distributor and apparatus sales, **Linde Co.,** a division of Union Carbide Corp.

Wilbert Fall was made assistant vice president in charge of railroad passenger car engineering for **Pullman-Standard Car Mfg. Co.** Former manager, passenger car engineering, Mr. Fall continues headquarters at the Worcester, Mass., plant.

E. Lawrence Gay was elected sec-

SQUEEZE PLAY FAILS TO SCORE AGAINST WEIRKOTE

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For brutal, iron-jawed pressure, a steam shovel has few equals. Here, in this crushing grip, Weirkote's zinc coating undergoes a murderous test.

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ROBERT G. ALLEN
Bucyrus-Erie president

W. SCOTT BLISS
Vulcan-Kidd marketing v. p.

LAWRENCE C. GLEASON
Gleason Works president

JAMES M. KNOX
Research-Cottrell president

LARS H. NORDENSON
Dresser foreign operations

L. H. RADER
Byers plant supt.

retary-treasurer, **Hewitt - Robins Inc.**, Stamford, Conn.

James M. Knox was elected president, **Research-Cottrell Inc.**, Bound Brook, N. J. He succeeds **Carl W. Hedberg**, who continues as a director of Research-Cottrell and the parent company, Research Corp. Mr. Knox was executive vice president.

R. C. Rieder, works manager, **Baker Perkins Inc.**, Saginaw, Mich., was elected vice president-manufacturing.

M. H. Barnes was appointed manager of crystal products for **Linde Co.**, a division of Union Carbide Corp. He was manager of the development laboratory at Speedway, Ind., and retains that position in addition to his new duties.

Raymond E. Melampy was appointed safety engineer for **Armco Drainage & Metal Products Inc.**, subsidiary of Armco Steel Corp., Middletown, Ohio.

Lars H. Nordenson was elected vice president in charge of foreign operations for **Dresser Industries Inc.** He moves from Paris, France, to Dresser headquarters in Dallas. Mr. Nordenson has served as sales manager in London and Paris offices for M. W. Kellogg Co.; also as an engineering executive for American Cyanamid Co., and Union Oil Co. of California.

A. M. Byers Co. appointed to its Ambridge, Pa., plant; **L. H. Rader** as superintendent, rolling and finishing mills; **Edward A. Turner**, maintenance superintendent; **H. S. Stevenson**, manager, conditioning department.

E. S. Esary, sales representative, was transferred from Granite City, Ill., to the Avonmore, Pa., sales office of **General Steel Castings Corp.'s** National Roll & Foundry Div.

J. H. France Refractories Co., Snow Shoe, Pa., appointed **Irving Dulberg** manager of research and quality control.

Robert G. Allen was elected president of **Bucyrus-Erie Co.**, South Milwaukee, Wis., effective Dec. 16. He succeeds **William L. Litle**, who will continue as chairman and senior officer. Mr. Allen was executive vice president. Mr. Litle became president in 1952, and has served as chairman and chief executive officer since 1957. **Victor C. Studley** was elected vice president-finance, succeeding **Frederick C. Weiblen**, who retires Dec. 15. **John R. Warner** was elected vice president-purchasing, also effective Dec. 16.

W. Scott Bliss was elected vice president-marketing, **Vulcan-Kidd Steel Div.**, Aliquippa, Pa., H. K. Porter Company Inc. **Raymond J. Zale**, general sales manager at the time of acquisition of Kidd last January, continues as general sales manager. Mr. Bliss was president of the former Kidd Drawn Steel Co., and has been manager of Kidd products since the combination of Kidd and Vulcan Crucible (forming Vulcan-Kidd Steel Div.) last February.

Lawrence C. Gleason was elected president of **Gleason Works**, Rochester, N. Y. He succeeds the late **E. Blakeney Gleason**.

OBITUARIES...

Norman T. Olsen, vice president, **Poor & Co.**, Chicago, and president of its **Peerless Equipment Div.**, died Nov. 16.

Robert A. Gillies, 70, retired vice president-operations, **Steel Company of Canada Ltd.**, Hamilton, Ont., died Nov. 26.

Charles F. Kettering, 82, former research chief of **General Motors Corp.**, died Nov. 25 at his home in Dayton, Ohio.

Herman A. Prosser, 83, retired vice president, **American Smelting & Refining Co.**, New York, died Nov. 22.

Robert B. Ganley, 44, vice president and general manager, **Syracuse Heat Treating Corp.**, Syracuse, N. Y., died Nov. 18.

Frank F. Poland, 63, recently retired assistant director, Rome, N. Y., division, **Revere Copper & Brass Inc.**, died Nov. 16.

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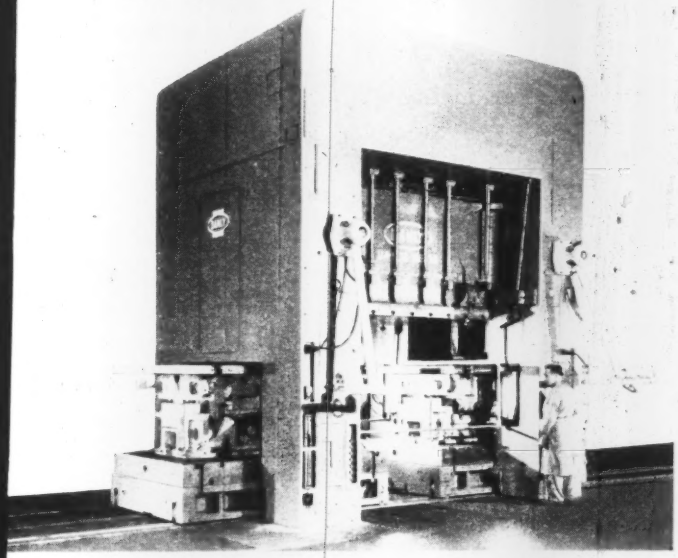


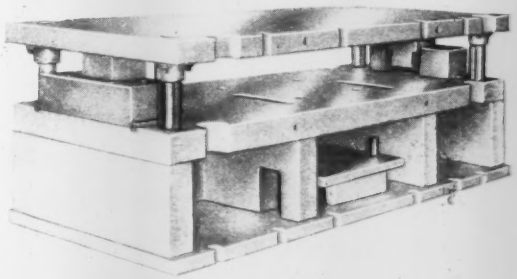
The report of the Business and Defense Service Administration shows that Danly led all producers of presses during 1957. Industry made Danly the first choice because you get lower operating costs with a Danly Press—you can depend on it! Each press is engineered to turn out more accurate stampings . . . to produce more units per shift . . . and to reduce profit-eating maintenance and spare parts inventories.

There are many new developments you should know about, such as the Quick Die Change feature available on all Straight Side Presses . . . single, double and triple action . . . the modern high-production Autofeeds . . . and the completely modern line of Open Back Inclinable presses just introduced. See how Danly can help you reduce costs and give your products the stamp of leadership!

Shown above: *Danly Quick Die Change Press.* Die at right leaves press as one at left moves into operating position. Time for the change: 6 minutes. Now operating in plant of French auto manufacturer.

Write for Quick Die Change Press Bulletin that contains drawings and complete description of these new presses.

in DIE SETS and Die Makers' Supplies



Danly is now working on its fifth million in die set production. Included in this production are many die sets for the automotive industry—that are working in that industry in its multi-million car production of today.

In every instance, Danly can meet your most exacting diemaking specifications with a die set—standard or special. Since pioneering the first mass-produced precision die sets 36 years ago, Danly has continuously developed new production, inspection and distribution methods to serve you better.

Today, there's the new Danly Die Set with Demountable Bushings being assembled in a factory branch or distributor assembly plant near you. It is your fast, convenient source for toolroom and pressroom supplies that bear the stamp of leadership. Danly facilities for special Die Set manufacture are also improved and expanded.

Shown above: a special Die Set that Danly recently built for Central Tool and Die Company, Inc. of Birmingham, Michigan for mounting a die for a major automotive manufacturer. It is equipped with Danly Demountable Bosses, above, and Bushings, below.

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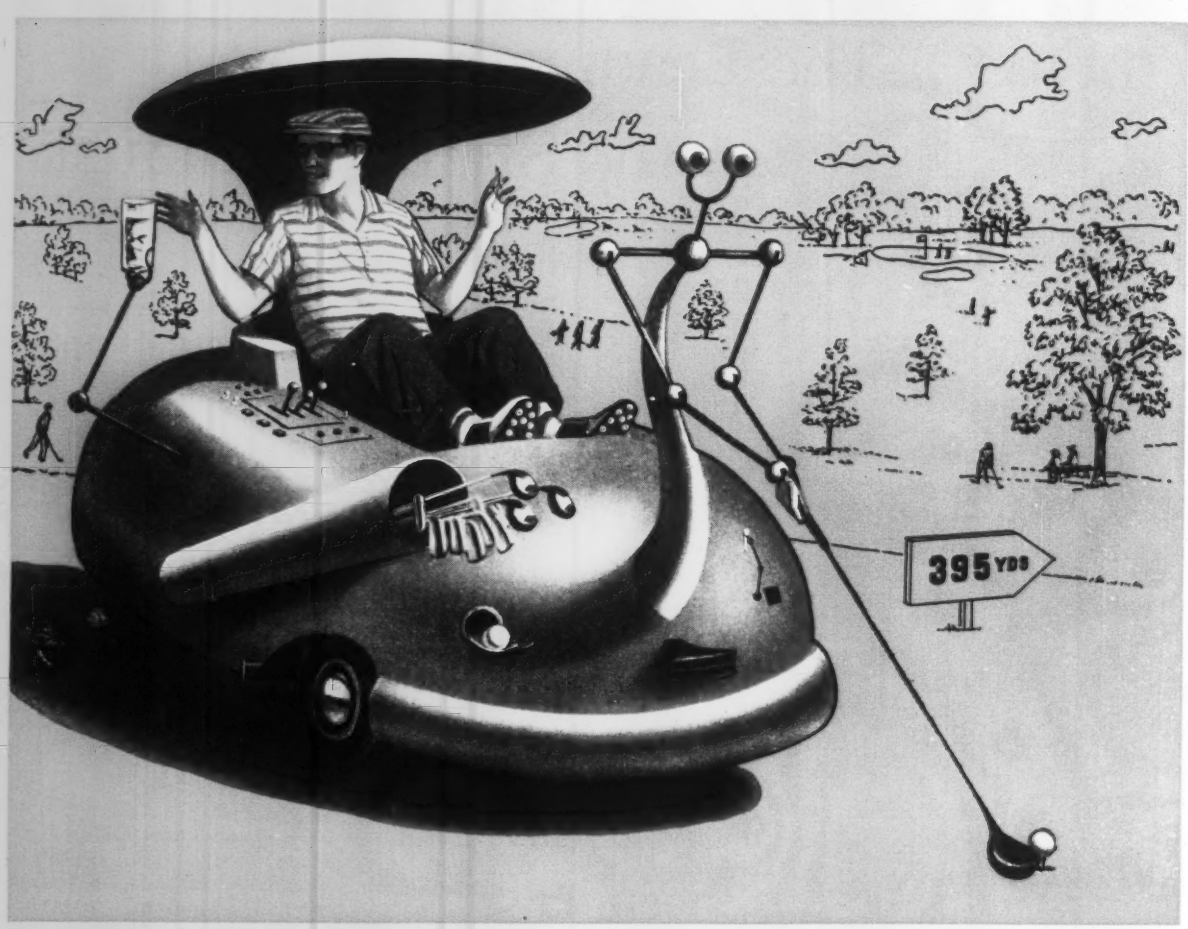
DANLY

2100 S. Laramie Avenue, Chicago 50, Illinois



No matter what you make from cold rolled steel

An ALAN WOOD Representative can help!

Designed for the golfer who likes to goof . . . off. But before you produce the "Golf-Master", you had better find out about cold rolled steel from your A.W. Representative. He is the man to see in every case! Your A.W. Representative may order a metallurgical study of your problems and bring about savings that build new profits and greater potential. He can provide you with the latest information on cold rolled steel and its application, plus experienced advice on the gauge, size and type to order. Call him today. Your A.W. Representative is always available . . . never out of touch with your location.

IRON PRODUCTS
"Swede" pig iron

STEEL PRODUCTS
Plates (sheared)
A.W. Dynalloy (high strength steel)
Hot rolled sheets
Hot rolled strip
Cold rolled sheets
Cold rolled strip

ROLLED STEEL FLOOR PLATE
A.W. ALGRIP *abrasive*
A.W. SUPER-DIAMOND *pattern*

COAL CHEMICALS

A.W. CUT NAILS
Standard & Hardened

MINE PRODUCTS
Iron ore concentrates
Iron powder
Crushed stone
Sand

COKE
Foundry, industrial & metallurgical

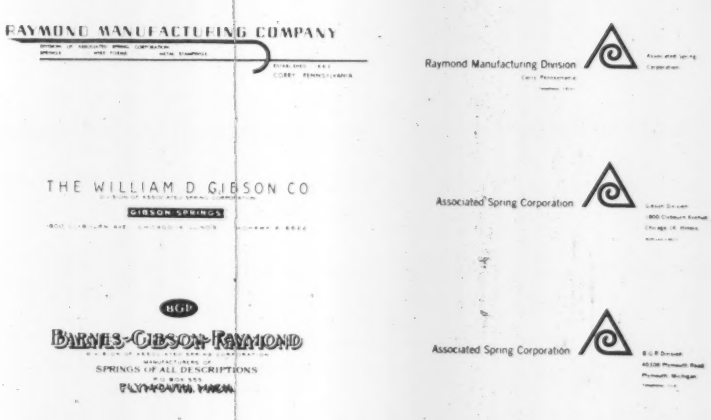
PENCO METAL PRODUCTS DIVISION
Steel cabinets, lockers & shelving

ALAN WOOD STEEL COMPANY

steelmasters for more than a century and a quarter • CONSHOHOCKEN, PA.

DISTRICT OFFICES AND REPRESENTATIVES: Philadelphia New York • Los Angeles • Atlanta • Boston • Buffalo • Cincinnati Cleveland • Detroit • Houston • Pittsburgh • Richmond • St. Paul San Francisco • Seattle

Montreal and Toronto, Canada—A. C. Leslie & Co., Limited



Before and after letterheads show how new trademark improves identity

Trademarks Can Help You Build a Company Image

HOW WOULD YOU go about finding a single trademark to express the corporate image of 17 separate manufacturing and sales organizations, most of which have histories of almost complete autonomy?

Associated Spring Corp., Bristol, Conn., faced the problem when it decided that centralized policy making and control would result in more efficient operations.

Eleven separate divisions were involved. Most had originated as independent companies, some over 100 years ago. They had their own identities. If Associated Spring's new policy were to succeed, the firm had to come up with a symbol that would identify the relationship of all divisions.

• **How It Was Done**—Two problems were anticipated: Such a project involves a lot of opinions, and a final decision requires agreement among many people.

A stalemate was averted by employing the services of Lippincott & Margulies Inc., an industrial design firm.

The adopted design centered on a unique symbol as the key element (see illustration). Other elements of identity (such as division name, address, and relationship to the corporation) were combined with the trademark, but emphasis was kept on the symbol.

Company officials say the design was chosen because: It has a strong "A" connotation in keeping with the company's first initial; triangle points and the break in the bottom line that turns to make a springlike shape suggest precision and tension (basic spring characteristics), but they do not restrict the company to springmaking; the top sides of the triangle act as an umbrella over the spring shape and give the feeling of a large and all-encompassing organization.

The symbol is also simple and easy to remember.

The new trademark is being applied to forms, letterheads, signs, packaging, trucks, and other media of external communication as the need for renewal arises. The company felt it would cost too much to make a complete changeover at one time.

• **Results**—The program has made customers and prospects aware of the family relationship of the divisions by putting identity on a national scale.

Pfister Aluminum To Move

Pfister Aluminum Corp., Allendale, N. J., purchased a mill at North Adams, Mass. Extensive alterations at the one-time textile mill will begin at once. Principal products of the firm are aluminum tubing, extrusions, coils, and rolled shapes.

Salem-Brosius Expands

Salem-Brosius Inc., Pittsburgh, has begun a $500,000 expansion at the plant of its subsidiary, Alloy Mfg. Corp., that city. The project will more than double Alloy's capability as a supplier of reactor components for the nuclear energy field. A production machine shop, plant office building, and x-ray inspection equipment will be added to the firm's facilities.

Forms Canadian Subsidiary

All-State Welding Alloys Co. Inc., White Plains, N. Y., has organized a subsidiary, All-State Welding Alloys Co. of Canada Ltd., at 141 Kipling Ave. S., Toronto 18, Ont. The complete list of All-State's lines of alloys and fluxes will be available from that point and their manufacture in Canada will start soon.

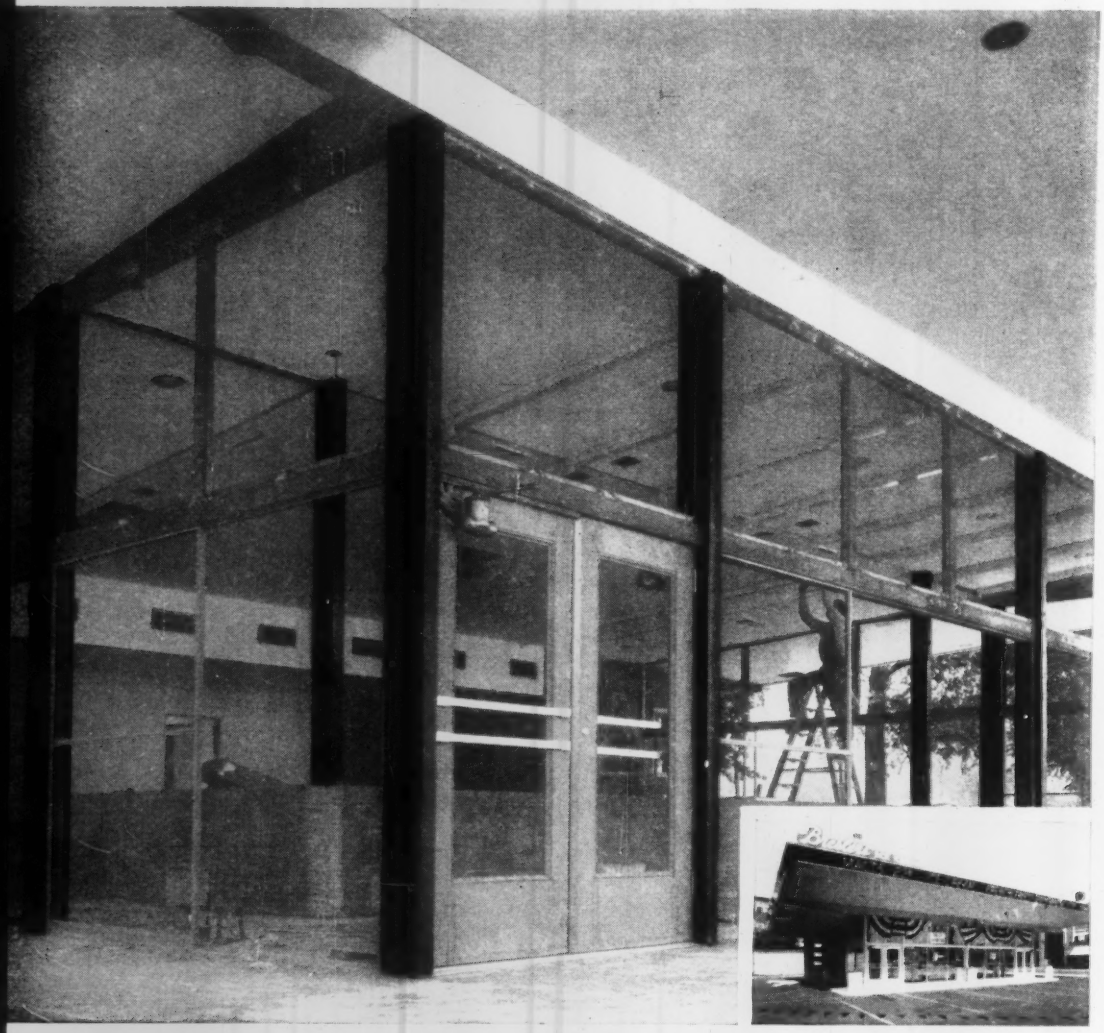
Builds Structural Mill

Manufacture of a large structural mill for the South Chicago Works of U. S. Steel Corp. is nearing completion. Rolling mill equipment for the installation includes a 40 by 90 in., 2-high reversing breakdown blooming mill; four 34 by 80 in., 2-high mill stands; and four universal beam stands with their respective edging mills; and a complement of tables, transfers,

(*Please turn to Page* 98)

How they built it better

with USS National Seamless



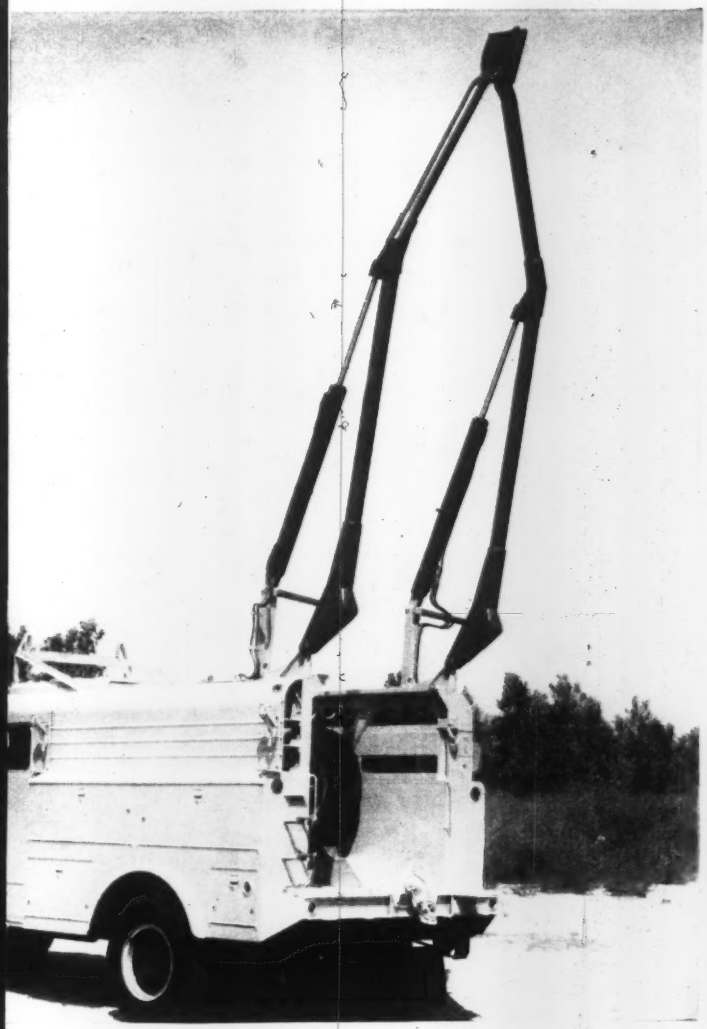
Drive-In Restaurant. This is one of a chain of Henry's self-service restaurants in the Chicago area. Built of steel, glass, tile and concrete, all of these buildings are identical in design. The unique feature is that every vertical supporting column in these buildings is fabricated* from sections of 4" x 8" Shelby Seamless Rectangular Steel Tubing. Four tons of this ¼" wall tubing were used in each restaurant. These columns of Shelby Seamless Tubing are consistent in quality and strength, and provide a handsome, uniform appearance.

**Fabricator's name on request.*

National Tube Division of USS United States Steel

Columbia-Geneva Steel Division, San Francisco, Pacific Coast Distributors • United States Steel Supply Division
United States Steel Export Company, New York

Pipe and Tubes



"Pole-Master"* Hydraulic Derrick. The powerful, two-legged boom of this hydraulic derrick is made of USS Shelby Seamless Mechanical Steel Tubing. The great strength, lightness, and shock absorbency of Shelby Seamless enables it to handle poles up to 75 feet in length with relative ease. The boom is activated by two hydraulic cylinders, also made of Shelby Seamless Tubing, which are powered by a heavy-duty hydraulic pump. Operating arc of the derrick is more than 180 degrees. It is designed to "set" or "pull" poles from the ground.

**Manufacturer's name on request.*

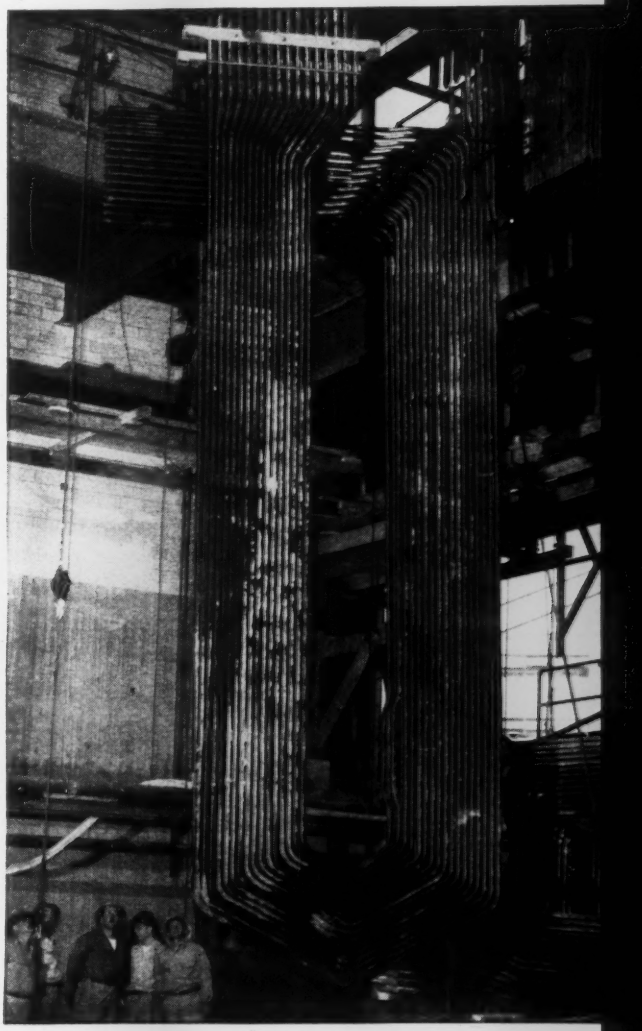


Photo: Courtesy Combustion Engineering, Inc.

Giant Superheater Coils. This king-size superheater coil being hoisted into position is only a small portion of the total USS National Seamless Steel Tubing installed recently in a huge modern boiler. Actually, *49 miles* of National Seamless Tubing were used. Here, steam at more than 2000 psi is superheated to 1000°F. In spite of this severe duty, it poses no problem for National Seamless, which is, in fact, built to withstand much higher pressures and temperatures. National Seamless Tubes have the strength, uniformity and dependability of solid forgings.

Perhaps USS National Seamless Pipe and Tubes are just the materials you've been looking for to cut costs, lighten weight, increase strength, shock-absorbency and workability in your product. Why not get in touch with us and find out? Write to National Tube Division, United States Steel, 525 William Penn Place, Pittsburgh 30, Pa. Or, for Shelby Seamless Tubing, contact your nearest Shelby Distributor.

USS, National, and Shelby are registered trademarks

a bright new wire with a brighter tighter finish

Brytite®

A PATENTED GALVANIZING PROCESS

SO BRIGHT—Use *Brytite* wherever a shinier, brighter zinc coating is desired for long lasting, more sparkling product appearance. Eliminate polishing and special finishing operations

SO TIGHT—Brytite has remarkable forming qualities. The zinc coating is so tight it will withstand severe deformation of the base metal without flaking, powdering or peeling.

SO CLEAN AND SMOOTH—Satin smooth in looks and feel, BRYTITE immediately raises the quality appeal of your product. You get smoother production, too—the result of precise uniformity and quality controls.

ROUND AND SPECIAL SHAPES—*Brytite* is available in many sizes in round wire, and may on inquiry, be furnished in standard and special shapes—flat, half-round, oval, half-oval, square, rectangular, and many others.

TEMPERS AND ANALYSES—Specify BRYTITE in various tempers and analyses in the low carbon and medium low carbon steels.

FINISHES—Satin Finish, Unwiped (where a heavy weight of zinc coating is required) and Redrawn, in certain sizes.

no polishing...no buffing...no finishing...

withstands difficult forming operations

CONTINENTAL STEEL

CORPORATION · KOKOMO, INDIANA

PRODUCERS OF Manufacturer's Wire in many sizes, tempers and finishes, including Galvanized, KOKOTE, BRYTITE, Flame-Sealed, Coppered, Tinned, Annealed, Liquor Finished, Bright, and special shaped wire. Also Welded Wire Reinforcing Fabric, Nails, Continental Chain Link Fence and other products.

(Concluded from Page 95)

saws, and other auxiliary equipment. Products will include a variety of standard structurals, wide flanged beams, piling bars, and semifinished billets.

Retains Ownership of Line

Electronic Controls Corp., Detroit, has retained ownership of the line of products which it is manufacturing for Clark Controller Co., Cleveland. The line includes photoelectric and other electronic devices for control, safety, counting, and measuring applications. The Nov. 17 issue of STEEL reported that Clark Controller had expanded into the electronic control field and inadvertently implied that Electronic Controls Corp. had surrendered ownership of its line.

Mercast Mothballs Plant

Mercast Corp., Beverly Hills, Calif., is mothballing the plant of its subsidiary, Alloy Precision Castings Co., Cleveland. The work in process and key personnel of Alloy Precision Castings have been moved to the West Coast where Mercast Corp. operates another subsidiary, Mercast Mfg. Corp. A regional sales office will be maintained by Alloy Precision at Cleveland under the direction of W. S. Poremba, sales manager.

Stamping Firm Modernizes

Eastern Tool & Stamping Co. Inc., Saugus, Mass., has modernized its plant. Exteriors of buildings have been remodeled, machinery has been relocated, and new departments have been established within the plant. The firm fabricates metals and provides completely equipped departments for toolmaking, welding, inspection, and allied operations.

Promotes Aluminum Bridge

Fairchild Engine & Airplane Corp., Hagerstown, Md., and former members of the Fairchild Kinetics Div. management have formed a new company, American Aluminum Structures Inc. The firm will concentrate on development and exploration of marketing opportunities afforded by the Fairchild aluminum

Why you get more than a motor from Century Electric

Availability, quality, and know-how—all the things you want in motors. Here's why you get all this and *more* with Century Electric motors:

Availability—Ordering is simple because you can get any motor you need from 1/20 to 400 hp. When you have a wide variety of motors from which to choose, it's easier to get the one you need. Think how you save time when you get answers to all your motor needs in one place.

Quality—Anyone can make claims about high manufacturing standards and quality control. But the best proof of Century Electric quality comes from years of outstanding service. Ask the man who sees every kind of motor sooner or later—the service repair shop man. He'll rate Century Electric motors outstanding.

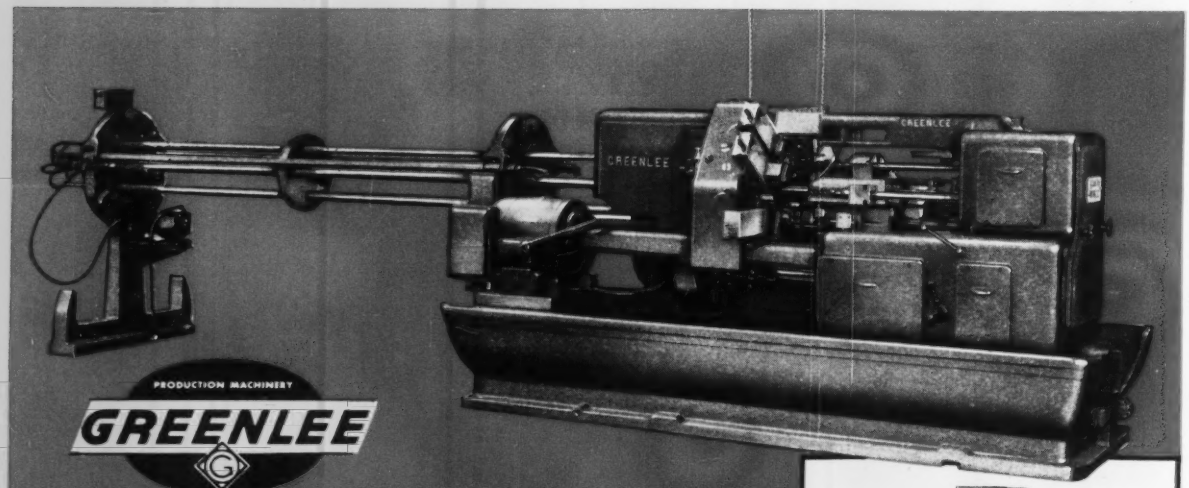
Application know-how—Century Electric sales engineers know motors. They apply, engineer and think motors and nothing but motors. They can give you on-the-spot help in selecting the right motor—to make sure you get the best one for the job.

Fast answers—You get fast answers to your motor and generator questions from Century Electric. Quotations, models, drawings—whatever you need. When you come to Century Electric you get *more* than a motor. For more information, contact your local Century Electric Sales Office or Authorized Distributor. Century Electric Company, 18th and Pine Street, St. Louis 3, Missouri.

CENTURY ELECTRIC COMPANY

St. Louis 3, Missouri *Offices and Stock Points in Principal Cities*

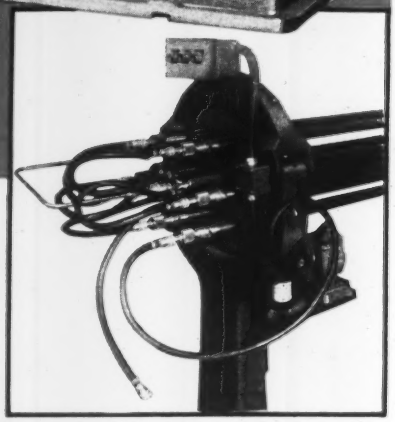
Century



PRODUCTION MACHINERY

GREENLEE

MULTIPLE FEED-OUTS...



A Natural

on Greenlee Air-Feed Automatics

Feed Out Stock to 16½"
Eliminate Pushers and Feed-Out Cams

Removable fittings attach air lines to the stock reel tubes. A vacuum pump withdraws the piston when restocking. Push-button control panel is provided for starting and stopping.

Greenlee Air-Feed Automatics offer you a 3-way profit advantage:

1. Maintenance and change-over time is reduced by eliminating stock pushers, feed tubes and feed-out cams.
2. Stock can be automatically air-fed to position in one or more machining stations permitting two or more pieces per cycle.
3. Multiple feed-out flexibility enables you to finish machine a variety of pieces that ordinarily demand costly second operation setups.

If you are running into production headaches on a specific job, Greenlee may be able to adapt an "Air-Feed" to solve your problem. See your Greenlee Distributor.

Write for your copy of Catalog A-405 — first step on the way to more profitable production with Greenlee Automatic Bar Machines.

• • •

Greenlee Standard and Special Machine Tools

Multiple-Spindle Drilling and Tapping Machines

Transfer-Type Processing Machines

Six and Four-Spindle Automatic Bar Machines

Hydro-Borer Precision Boring Machines

GREENLEE
BROS. & CO.

1932 MASON AVE.
ROCKFORD, ILL.

bridge. Officers of the new firm are: President, A. A. Gassner; vice president, H. J. Kahn; comptroller-treasurer, Roger Davis; and secretary, P. S. Cleaveland. Headquarters have been established at 1860 Broadway, New York, N. Y.

J&L Builds Sintering Unit

Jones & Laughlin Steel Corp. has started construction of an ore sintering plant and ore screening facilities at its Aliquippa (Pa.) Works. The unit will more than triple the output of blast furnace sinter at Aliquippa. (About 90 railroad cars of blast furnace burden will be made daily.)

Blast furnace performance will be increased about 20 per cent. Upon completion of the facilities in 1960, the daily rated capacity of the five blast furnaces at Aliquippa will be about 7200 tons of pig iron. Dravo Corp., Neville Island, Pa., has been awarded the construction contract.

The project represents the second step in J&L's program to improve its blast furnace burden through the beneficiation of ore. A new ore sintering plant (daily capacity of about 2500 tons) was put into operation at its Cleveland Works earlier this year, increasing blast furnace capacity at Cleveland to about 2700 tons of pig iron daily, a gain of about 500 net tons.

J&L's Stainless & Strip Div. has enlarged the servicing facilities at its Detroit plant. They will extend accommodations for stainless steel billet and bar inventories.

NEW OFFICES

Berry Hydraulics Div., Oliver Tyrone Corp., Corinth, Miss., opened a southern district sales office in that city with H. S. Cain as district sales manager in charge. General sales offices will be maintained in Pittsburgh under the direction of C. R. Taylor, manager of sales engineering. The firm produces hydraulic pumps, motors, and transmissions.

F. C. Russell Co., Columbiana, Ohio, opened a sales office and warehouse at Camden, N. J., under the direction of A. N. Blakesley. Products include: Windows, doors,

(*Please turn to Page* 104)

When you need 52100 steel bars and tubes go direct to Peterson....world's largest stocks. NOTE: For better machineability specify *leaded* bars.

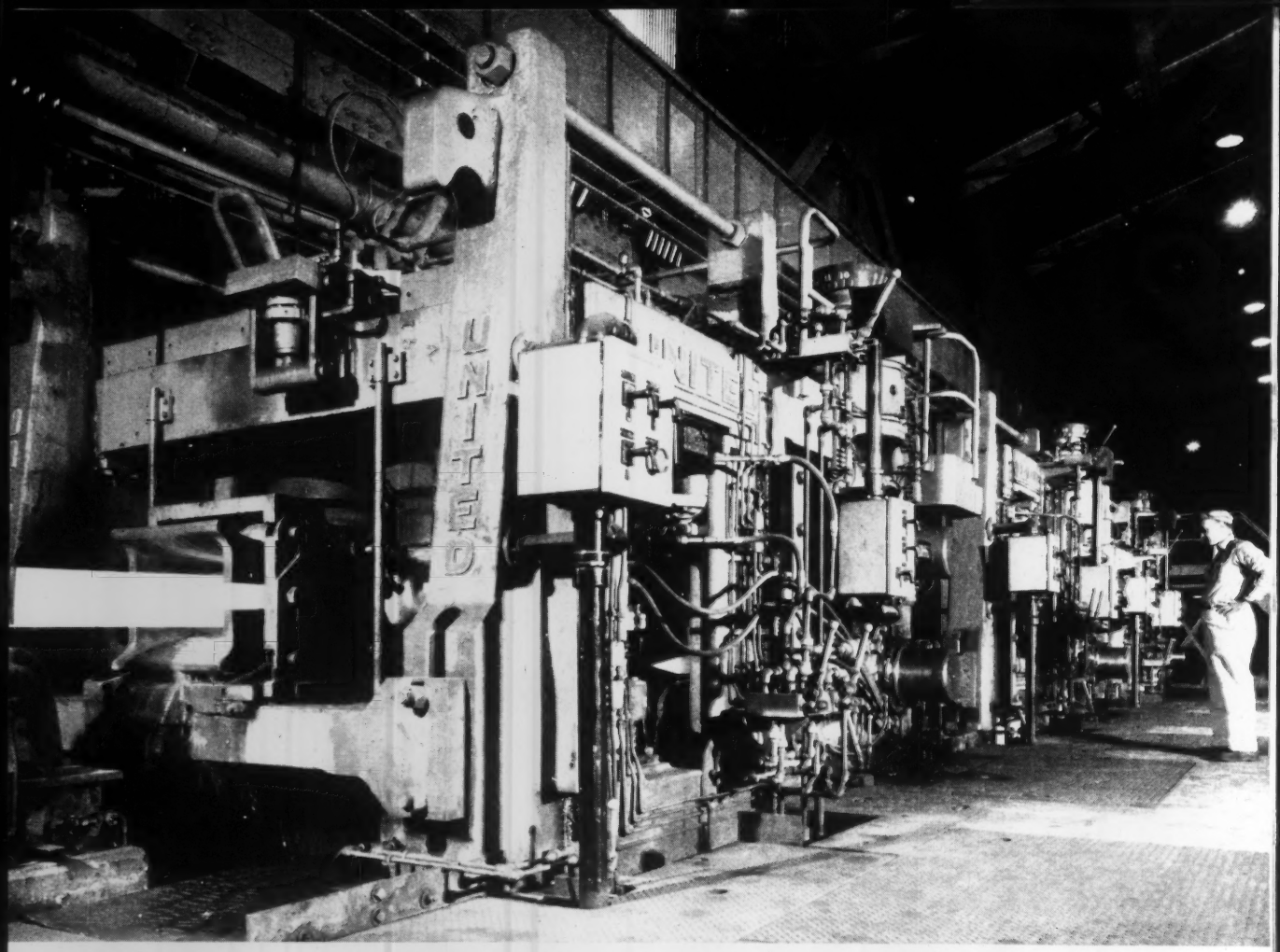
52100

ONE WAY

PETERSON

STEELS, INC.

Union, New Jersey • Detroit, Michigan • Chicago, Illinois



Massive new billet mill rolls blooms into rounds for tubes or billets for wire in continuous operation through six stands of rolls. It's one of the most modern billet mills in the world. Entire unit was installed in only 480 hours.

STILL MORE PROGRESS

New $6-Million Mill At Pittsburgh Steel Improves Quality, Boosts Efficiency

The march of Progress that began eight years and 111-million dollars ago at Pittsburgh Steel Company has taken another surge forward—this time with installation of a six-million dollar continuous billet mill.

Duplicated by only one other steel producer, the new primary rolling unit will give Pittsburgh Steel's customers faster delivery and insure continued uniformity of product.

Teamed up with the other major projects in Pittsburgh Steel's Program of Progress, the new six-stand "straight-ahead" mill will help maintain the Company's competitive position, thereby increasing its earning potential.

• **Part of Program of Progress.** The new billet mill marks completion of the Company's blast-furnace to cooling yard rebuilding of primary steel-making facilities. Coke ovens, blast furnaces, open-hearths, soaking pits, blooming, billet and bar mills have been rebuilt and modernized since the Program of Progress got underway.

More specifically, this new 30-inch billet mill, with its six alternating horizontal and vertical stands of rolls can process a wider range of billets for wire and rounds for tubes than the old 28-inch mill it replaces. Thus, new and wider markets for Pittsburgh Steel's products are being opened. The **plus** quality it provides is reflected in finer surface finish and closer size tolerances.

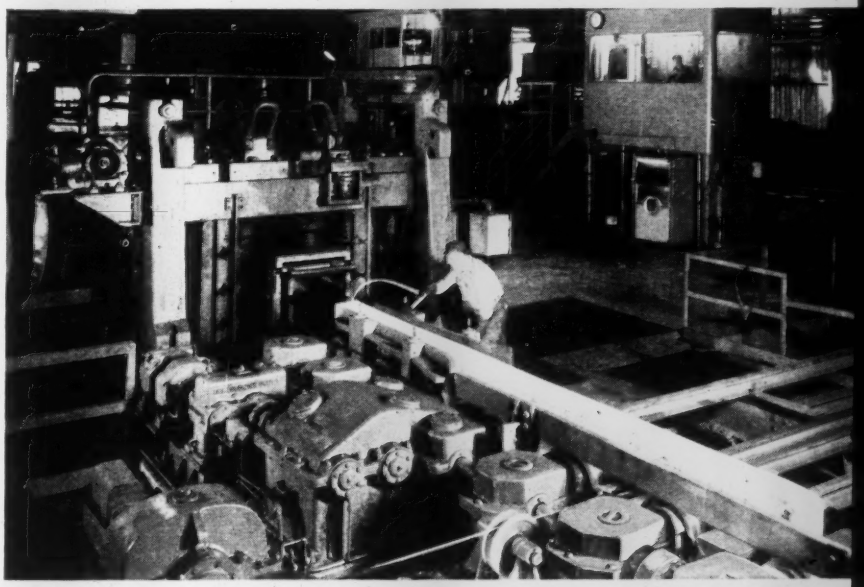
For these reasons, Pittsburgh Steel is gratified that construction of the new billet mill at its Monessen

(Pa.) Works was successfully carried out despite the large investment required, the lack of adequate provision for depreciation in our tax laws, and the dip in demand for steel during the past year.

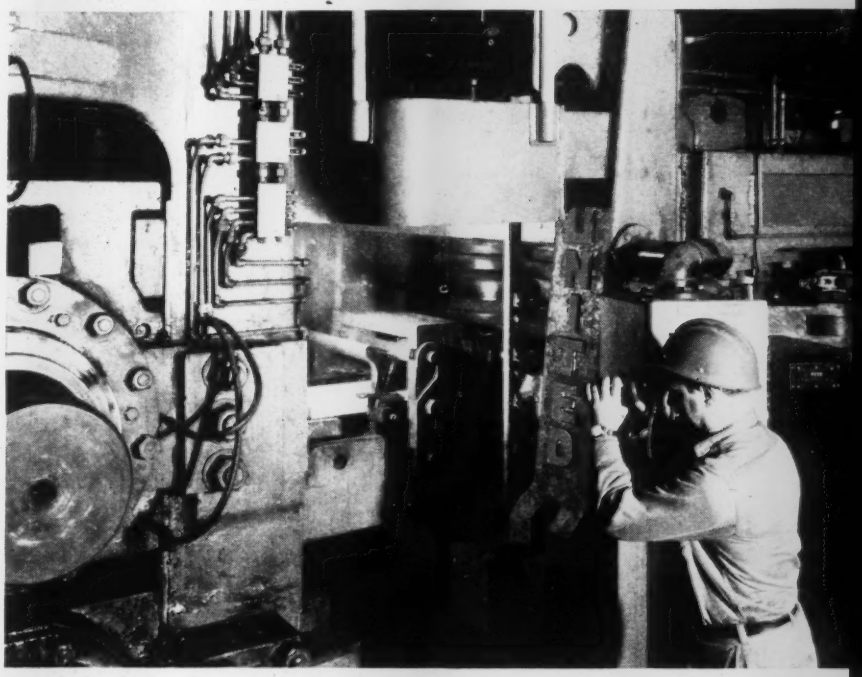
Credit for speedy installation of the mill with a minimum of lost operating time must be given to the ingenuity of the operating and engineering departments. By careful planning they kept the old mill in operation—did much of the preliminary installation while hot steel was being rolled above and beside the construction crews.

Then, on August first, the old mill was shut down and installation of the massive unit began as a round-the-clock operation. A mere 480 hours later—as engineers and millwrights—superintendents and electricians—metallurgists and mill crews watched anxiously, a button was pressed and the first bulky, red-hot, six-ton bloom was successfully reduced in dimension and lengthened into a billet in the speeding rolls.

This engineering achievement is typical of the spirit of the new Pittsburgh Steel Company. It stems from a quiet determination to modernize and improve its facilities—to widen and deepen its markets—to diversify its product line—so that all may benefit alike—customers—employees—stockholders and our general economy.



Bloom enters first of six roll stands—three of which are horizontal and three vertical for unique rolling action which assures uniformity.



Quality. Rolling temperature has important bearing on quality and is checked here by inspector with optical pyrometer as billet enters final roll stand.

Deftly, skilled operator in pulpit regulates mill speed and roll pressure—important factors in maintaining quality and dimensional accuracy.

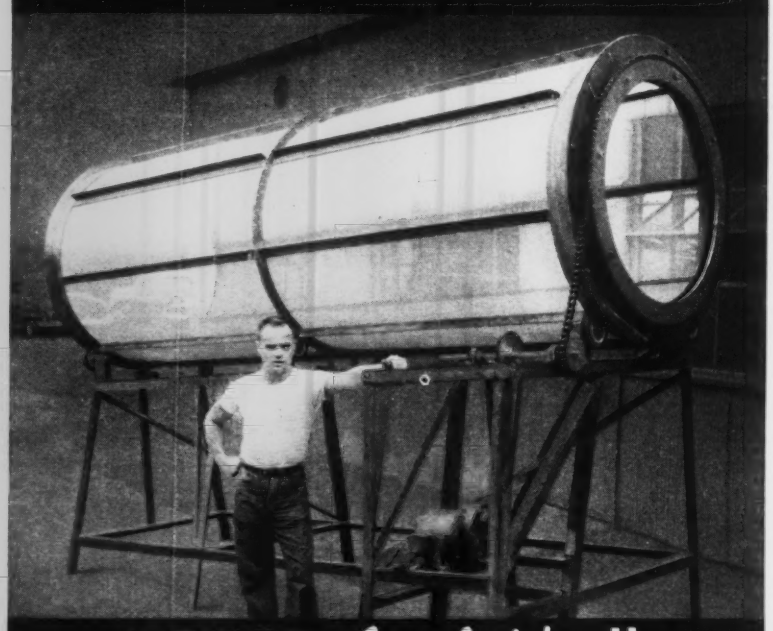
Pittsburgh Steel Company

Grant Building • Pittsburgh 30, Pa.

District Sales Offices

Atlanta	Cleveland	Dayton	Los Angeles	Pittsburgh
Chicago	Dallas	Detroit	New York	Tulsa
		Houston	Philadelphia	Warren, Ohio

"WIRE CLOTH FABRICATIONS?"



"CALL Cambridge"

"You tell us what you need, and we'll have it for you fast— whatever the size or shape"

Roland's right, too. Here at Cambridge he's part of a team that has produced everything from thimble-sized strainers to king-sized dewatering screens, often well ahead of schedule. Whatever your requirements, you're assured of quality workmanship and prompt service when you call Cambridge. And, we'll work from your specifications or draw up prints for your approval.

TO MEET YOUR BULK WIRE CLOTH NEEDS, we have a wide variety of specifications from the finest to the coarsest mesh in any metal or alloy in the most frequently used specifications ready for immediate shipment. Individual loom operation and careful inspection just before shipment assures accurate mesh count and uniform mesh size.

Let us quote on your next order for wire cloth. Call your Cambridge Field Engineer listed in the telephone book under "Wire Cloth". Or write direct for FREE 94-PAGE CATALOG and stock list giving the full range of wire cloth available. Describes fabrication facilities and gives useful metallurgical data.

The Cambridge Wire Cloth Company

WIRE CLOTH | METAL-MESH CONVEYOR BELTS | WIRE CLOTH FABRICATIONS

DEPARTMENT J, CAMBRIDGE 12, MARYLAND

OFFICES IN PRINCIPAL INDUSTRIAL CITIES

(*Concluded from Page 101*)

overhead garage doors, and electronic garage door openers.

Berry Bearing Co., Chicago, opened a stock-carrying branch at 568 N. Chicago St., Joliet, Ill. The firm distributes bearings, bearing specialities, and transmission appliances.

NEW ADDRESSES

Federated Metals Div., American Smelting & Refining Co., New York, moved its St. Louis sales office to its new plant at Alton, Ill. C. R. Kenner is district manager.

Crucible Steel Co. of America, Pittsburgh, moved its Twin Cities sales branch office and warehouse to 2911 Como Ave. S.E., Minneapolis, Minn. A. C. Paulson is branch manager.

Foredom Electric Co. Inc., manufacturer of flexible shaft machines, dental engines, and percussion vibrators, transferred all operations to its new plant in Bethel, Conn.

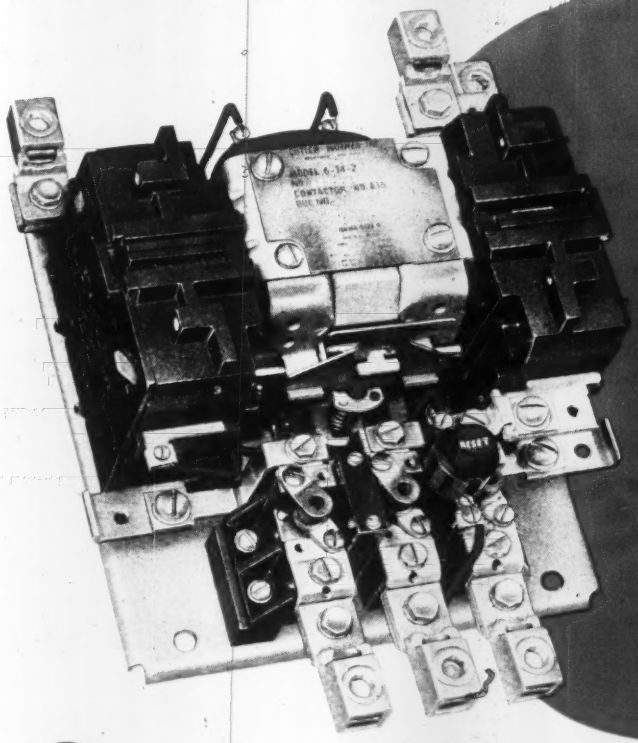
ASSOCIATIONS

Dr. T. B. Massalski, Polish-born scientist, outstanding in the field of solid state physics, has been appointed senior fellow in the metal physics fundamental research group at **Mellon Institute**, Pittsburgh.

American Standards Association, New York, elected these officers: President, J. R. Townsend, Office of Assistant Secretary of Defense, Washington; and vice president, F. H. Roby, Federal Pacific Electric Corp., Newark, N. J.

Ultrasonic Manufacturers Association, New Rochelle, N. Y., elected these officers: President, J. T. Welch, Sheffield Corp., Dayton, Ohio; vice president, N. G. Branson, Branson Ultrasonic Corp., Stamford, Conn.; treasurer, S. E. Jacke, Detrex Chemical Industries Inc., Detroit; and secretary, R. L. Rod, Acoustica Associates Inc., Mineola, N. Y.

50 Hp 220 Volts, 100 Hp 440 550 Volts Max. Polyphase



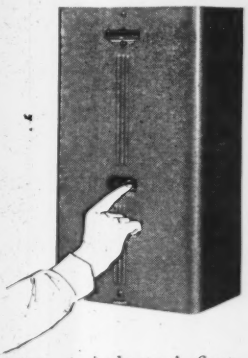
New SIZE 4 STARTER

. . . another Cutler-Hammer Three-Star achievement

New *compact design saves valuable panel area*

New *parallel contact design provides increased electrical life at full capacity*

New *low mass movable members insure superior mechanical life*



This is the new Cutler-Hammer NEMA Size 4 Starter . . . industry's first large horsepower starter offering all the desired features of the famous Cutler-Hammer Three-Star Motor Control line. Smaller, more compact, this new starter simplifies control panel design and saves valuable panel area. Tests of the new parallel contact structure show vastly improved electrical life even when operated at full capacity. Further, this new design reduces the size and weight of the movable members resulting in less impact wear and unsurpassed mechanical life. We've tested it against all others, why don't you? The new Cutler-Hammer Size 4 Starter ☆ installs easier, ☆ works better, ☆ and lasts far longer. Get all the facts today. Write for the new descriptive bulletin EN 125-Y-213. Cutler-Hammer Inc., Milwaukee 1, Wisconsin.

Look for these outstanding features . . . you'll find them only in Cutler-Hammer Three-Star Motor Control

- U-shaped cover easily removable for unobstructed inspection and accessibility
- Straight through wiring . . . line terminals at the top, load terminals at the bottom
- New pressure type terminals cut wiring time and effort
- Adjustable overload relays can be set to trip within 3% of full load motor current
- Precision cast overload sensing coils can't lose their accuracy
- Widely desired three-phase, three-coil overload protection is a standard optional feature . . . no special attachments or enclosures
- Indestructible molded magnet coil . . . color coded for positive voltage and frequency identification
- Easily installed convertible electrical interlocks require no special adapters . . . provide up to four extra control circuits
- Available as non-reversing, reversing, and multi-speed contactors and starters in the open type, NEMA 1, and all special purpose enclosures.

CUTLER-HAMMER CONTROL C-H

CUTLER-HAMMER

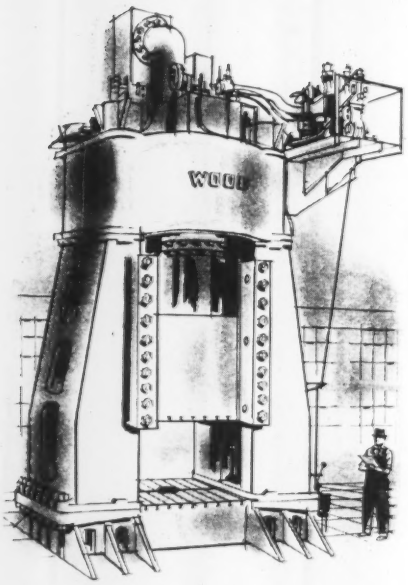
Cutler-Hammer Inc., Milwaukee, Wis. *Division:* Airborne Instruments Laboratory. *Foreign:* Cutler-Hammer International, C. A.
Associates: Canadian Cutler-Hammer, Ltd.; Cutler-Hammer Mexicana, S. A.; Intercontinental Electronics Corporation, Inc.

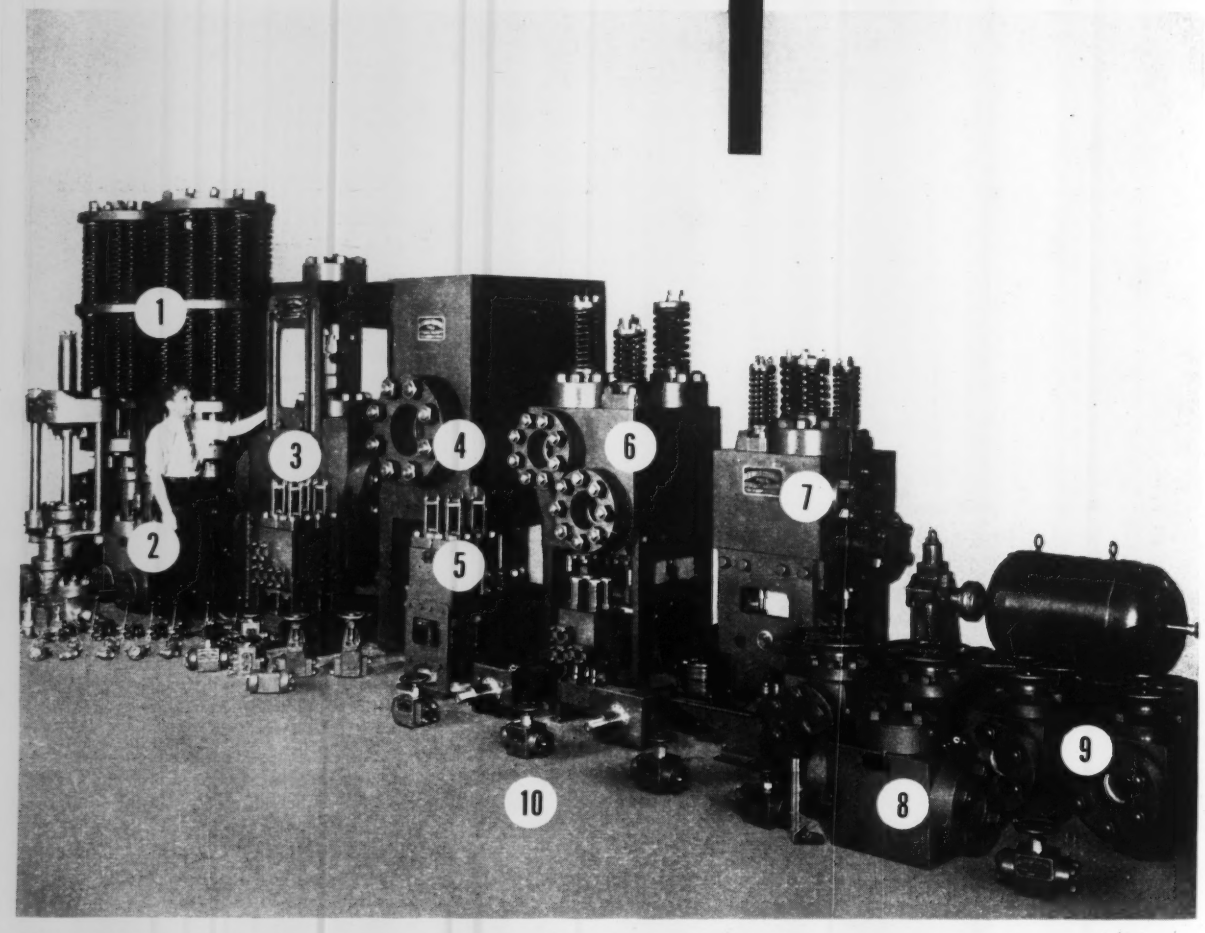
Every valve you need for a complete hydraulic system . . . from WOOD

Need a special valve or a complete hydraulic system? Call on R. D. Wood Company for help from men who know their high pressure valves. Take the line-up below, all Wood valves from one hydraulic forging press installation, working pressure 4500 psi. Note the broad range of sizes and types, from the small Stop and Check Valves to the large 6" x 8" Shock Alleviator Valves. They have been developed from years of experience in designing and building hydraulic equipment. Whatever your requirements, our engineering staff can design and apply the correct valves to do the job. Write today for complete information contained in the Wood brochure, "High Pressure Hydraulic Valves."

R. D. WOOD COMPANY

PUBLIC LEDGER BUILDING • PHILADELPHIA 5, PENNSYLVANIA





1. 6"x8" Shock Alleviators **2.** 2½"x4½" Twin Tilting Valve **3.** 9" Accumulator Shut off Valve **4.** 9" Accumulator Safety Shut off Valve **5.** 1½" Mandrel Gear Control Valve **6.** 6" Control Valve **7.** 4½" Control Valve **8.** 4" Check Valve **9.** 4" Stop Valves **10.** Misc. Stop, Check and Control Valves

Technical Outlook

December 8, 1958

TECHNOLOGICAL SWISH—In February, aircraft makers (through the Aircraft Industries Association annual survey) made a prediction: Within 10 years we will need materials to withstand 2500° F for a few minutes, and 4000° F for a few seconds. Less than seven months later, the prediction was obsolete. Bids are already in on a product that will have to withstand temperatures over 5000° F for more than a minute.

BEAT HEAT—New insulating materials are about 26 times more efficient than a standard vacuum, says Linde Co., a division of Union Carbide, New York. The firm uses some varieties to keep gases liquid. The best are keeping the pressure rise in unvented liquid helium bottles to less than 180 psi in 15 days. A 26,000 gallon tank thus insulated would lose less than 2.6 per cent of its capacity in a year.

PROGRESS IN TAPE CONTROL—Up to now, numerical control systems have been limited to 15 channels on one tape. General Electric Co., Schenectady, N. Y., has one that carries 83 channels on an inch wide tape. It was developed by Stanford Research Institute, Menlo Park, Calif.

HONEYCOMB FUTURES UP—Manned space vehicles will use many types of brazed sandwich construction as heat radiators, say George Cremer and Richard Mueller, Solar Aircraft Co., San Diego, Calif. Their prediction is based on the continuing success of honeycomb structures in missiles and hypersonic aircraft.

TITANIUM EXPANSION—Mallory - Sharon, Niles, Ohio, is making expanded titanium sheets. The primary beneficiaries are platers and chemical users who will find the metal lasts a long time. Sheets 4 ft by 8 ft come in gages of 0.050 to 0.125 in. They can be bent over a radius four times the metal thickness.

SILICONE TIPS—Dow Corning's new Silastic rubber sets up in 30 minutes (20 times faster than previous formulas), stays flexible at minus 70° F and plus 500° F. Another advance: Stanford Research Institute chemists have developed some additives for silicone hydraulic fluids used in high speed aircraft which prevent the fluid from gelling and oxidizing at 500 to 700° F. They are said to be 20 times better than unmodified silicone fluid.

FLOATING STAINLESS—Crosley Div., Avco Mfg. Corp., Cincinnati, makes a porous stainless steel for missiles and supersonic aircraft. In playing with it one day, some of the personnel discovered that it floats. Now they're looking for ways to use a steel that won't sink.

TESTS SMALL WIRE SPRINGS—H.C. Burnett of the National Bureau of Standards has found a better way to test springs for ordnance equipment. He knew that tensile strength isn't an adequate indicator, so he worked out torsion tests which do a better job. Some other results of his studies: Vacuum melted springs last twice as long as those made of cold drawn music wire; shot peening "significantly increases the fatigue life of specimens."

TIN-NICKEL PLATING—Swiss watches, drafting instruments, and fine mechanical devices are said to be impervious to finger marking and atmospheric corrosion when coated with 65-35 per cent tin-nickel. The compound (SnNi) has far better properties than either tin or nickel and is easily distinguished from chromium. Cost: About the same as nickel-chromium, but only one bath is needed.

PROBING CERMETS—The National Bureau of Standards wants better tests for cermets. Designers are handicapped by a lack of reproducible data. The bureau expects to come up with tensile, compressive, impact, torsion, and transverse tests.

TRAFFIC NOTE—Some $22 million is being spent by the American Association of State Highway officials on a project near Ottawa, Ill., to find out how pavements stand up under the pounding of trucks. One objective industrialists should watch: What is the ideal truck load?

Metalworking Outlook—Page 55 Market Outlook—Page 143

Boeing's Otto Plagens says:

You Can Afford To Maintain Numerical Control Equipment

"The publicized fears of those who have discussed numerical control appear to us generally unsupported. We anticipated more difficulty than we encountered. Our machines will probably cost less to maintain now that we have completed our initial shakedown"

IF YOU'VE been putting off buying numerically controlled machines because you've heard maintenance costs are excessive, now's the time to take another look.

You can't afford to pass up the benefits of numerical control—improved quality, reduced leadtime, lower production and tooling costs—and you can afford to maintain it.

To get a realistic evaluation of the method, STEEL went to the company which has the world's largest concentration of numerically controlled machines (NC for short) used in production—Boeing Airplane Co., Wichita, Kans.

It is using eight continuous path machines and four point-to-point machines in the production of the B-52G.

Here's how Otto Plagens, plant engineer, answered our questions:

Q: What fallacies do you see in the publicized fears of numerical control?

A: They appear to be generally unsupported by our experience. Reviewing our first year of operation, we see now that the problems we encountered were qualitatively no more complex or difficult than those we experienced when we first began to use advanced spotwelding equipment and our first electronically controlled machine tools.

In each case, we anticipated more difficulty than we ran into. Perhaps it was a good thing. As a result of our apprehension, we were prepared for the difficulties that did come. That would not have been the case if we had been convinced in advance that maintenance would be strictly routine.

Q: What have been your most serious maintenance problems?

A: The complexity of the NC process, from programming through part production, has increased the possibility of errors, inaccuracies, damage, and malfunctions that may cause machine stoppages.

One of our most serious problems involves isolating the causes of stoppage within this complex system, especially when two or more deficiencies are involved. The development of a systematic trouble-shooting checklist has enabled us to reduce the seriousness of this problem.

The equipment was new to programmers, operators, and mainte-

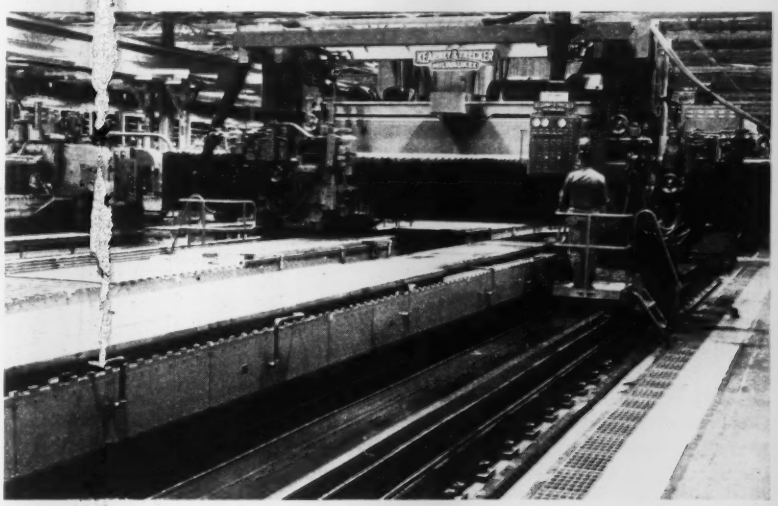
"Maintenance costs should be considered in relation to acquisition cost and productive capacity. We have proved that numerical control machines can reduce costs by almost two-thirds, cut leadtime as much as 70 or 80 per cent, improve quality, and reduce tooling costs"

"If you're going into numerical control, establish a suitable maintenance and operator training program. Ours cost $55,320. Trained people are not readily available, so you'll probably have to develop your own numerical control work force"

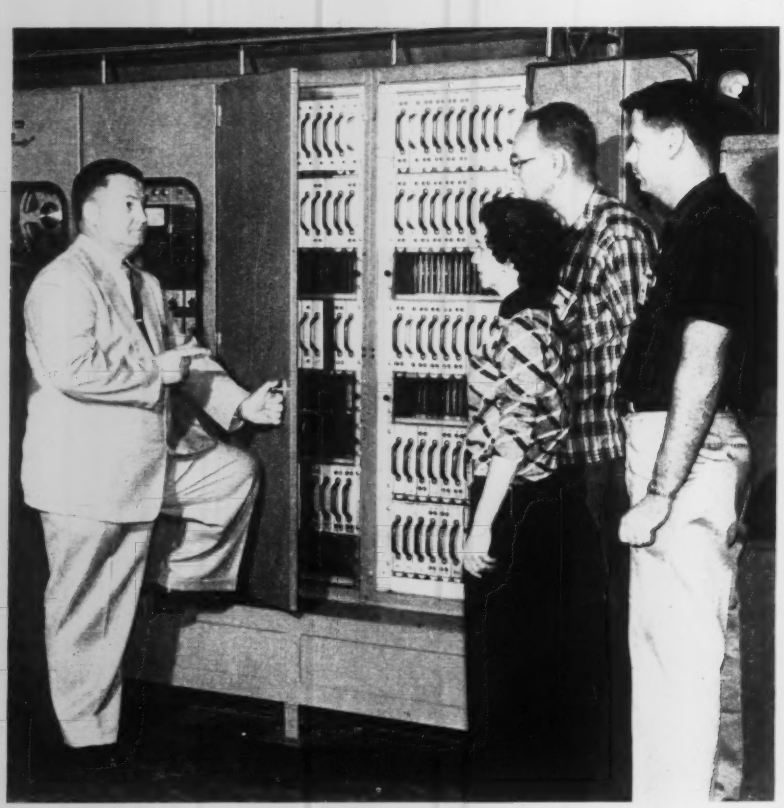
nance employees, and had not been checked out in production when we received it. Close, in-plant coordination was necessary, as well as consultation with the manufacturers.

As with any new equipment, not all problems could be anticipated by the designers, and working out solutions to the unsolved problems has given us considerable difficulty. The results of our experience are being used by the manufacturers to improve the quality of their equipment. Subsequent purchasers of these particular types of equipment should not have the same, nor as many difficulties.

Some of the problems have been due to the size of the equipment and the need for close tolerances. Those factors are not inherent



Three Kearney & Trecker skin mills like this one are used at Boeing-Wichita principally for contour milling on B-52G lower wing skin panels



Training sessions like this one helped Boeing-Wichita build its numerical control maintenance force. The instructor is briefing workers on a Bendix control unit for a Kearney & Trecker profile mill

Maintenance team checks out a Giddings & Lewis Numericord Director which converts punched tape into

characteristics of NC equipment.

Q: In your experience, does it cost more (excluding training costs) for a company to maintain NC machines than conventional machines of similar types?

A: The cost has been about the same as that for electronically controlled machines of the same general type which use a tracer or template type control.

However, it has recently become apparent that it will probably cost less to maintain the NC equipment now that we have completed initial maintenance shakedown.

If you consider maintenance cost in relation to acquisition cost of the equipment and its productive capacity, the cost of maintaining conventional manually controlled milling machines becomes much higher than the cost of maintaining NC milling machines.

Q: Do the profits gained from the better production efficiency of NC machines offset any increased maintenance costs?

A: Gains from improved production efficiency would far exceed any increase in maintenance costs if that situation were to develop. We have proved in production that NC machines in many cases can reduce costs by almost two-thirds, cut leadtime by as much as 70 or 80 per cent, and improve quality. They also can drastically reduce tooling costs.

Q: How much have you spent in training maintenance crews?

A: About $55,230. This includes time spent by maintenance employees in on-shift training classes as well as the expense of sending maintenance supervisors, specialists, and training section instructors to manufacturers' training courses.

Q: What maintenance warnings would you give to other metalworking companies about to buy NC machines?

A: Allow a reasonable period between installation and capacity loading to permit operation, functional, and maintenance shakedowns.

- Establish a suitable maintenance and operator training program, selecting only those with ability to absorb the information and adjust their outlook to conform to numerical control.
- Expect a change in the ratio of maintenance to direct labor costs. The complexity of NC equipment will drive maintenance costs up, but the greater productivity per manhour of direct labor makes the higher ratio bearable.

magnetic tape. Boeing's numerical control equipment is used in production of the new B-52G global bomber

Two workers check out the circuits of a General Electric control unit on a skin mill. Troubleshooting checklists enable Boeing to quickly find causes of machine stoppages, remedy them, and get them back into production

• Get the proper test equipment. (It probably isn't in general use at your plant now.)

• You will probably have to develop present employees for maintenance work force. Such people are not available on the open labor market.

• Arrange to have your key personnel visit other companies with experience in maintaining the particular type of control system and machine tool you are about to purchase.

• **Machines at Boeing**—Boeing has 12 NC machines at its Wichita plant. They include:

Three General Electric controlled Kearney & Trecker skin mills—they are five axis, magnetic tape controlled, continuous path milling machines. Each unit has a 65-ton moving gantry and a 12 x 85 ft stationary work bed.

Three Bendix controlled Kearney & Trecker profile mills—they are three axis, punched tape controlled, continuous path, profiling and contouring machines. They have a 20-ton moving column and a 48 x 168 in. upright angle plate work holder.

One General Electric controlled Morey profile mill—it is a three axis, magnetic tape controlled, milling machine with a moving 48 x 48 in. worktable.

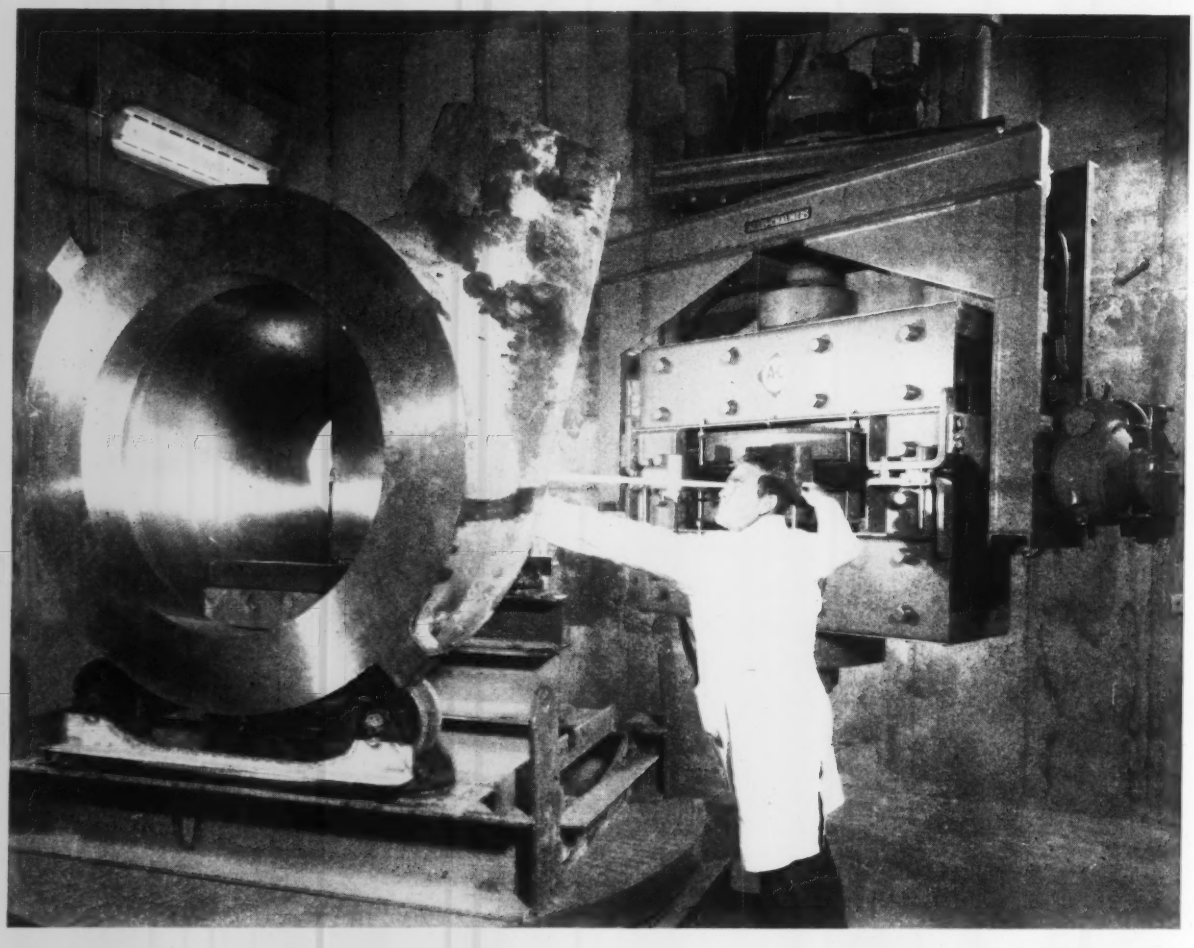
One Giddings & Lewis Numericord Director—it is a special purpose computer used to interpolate information generated by the IBM 705 computer and to record continuous command signals on magnetic tape. The tape is used to control the three skin mills and the magnetic tape controlled profile mill.

Four General Riveter Drivematic riveting machines—they locate the rivet point, drill, countersink, insert the rivet, drive and trim the rivet in one sequence. The work holder is 105 ft long and 4 ft wide. The riveter travels longitudinally along the workpiece.

Installed cost of the equipment is $4.5 million.

• **NC Gains Impressive** — Numerical control has piled up an impressive record in the short time it has been available to metalworking. It has helped many firms beat the cost crisis (STEEL, June 2, p. 66). Don't delay your evaluation of the method because of its complexity; you can afford to maintain it.

• An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.



Time was being wasted on this 24 million electron volt betatron

How We Beat the Cost Crisis

Six-Point Attack Shatters Inspection Bottleneck

The goal: Get rid of idle time in the inspection department to boost productivity. This article is one of the top entries in the Cost Crisis Awards Competition. Another will appear in next week's issue

OFTEN cost cutting succeeds or fails when it's still a proposal. If you're a middle manager, you need all essential information and estimates not only to make an intelligent evaluation, but to sell your ideas to top management.

If you're a member of top management, you need a thorough proposal to make your own evaluation —and to know that your subordinate's suggestions are well thought out and that his conclusions are valid.

No one argues with that—but how do you know what constitutes a good proposal? What do you look

Middle Management's Plan Paid Off in Three Weeks

Here are the six steps recommended to boost efficiency in inspection at Electric Steel Foundry Co. The information is taken directly from the proposal submitted to top management. All six steps were approved.

1 Provide portable film developing facilities.

Much time is lost in the betatron and gamma areas because operators must travel from their work areas to the darkroom to process and read radiographic plates made as technique trials. This can delay the shooting of a job for as long as an hour and sometimes happens several times a shift.

Present method requires about 1½ hours a shift—15 hours in a five-day week. The improved method should save 8.44 hours a week on the betatron (at $44 an hour) and 2.81 hours a week in the gamma area (at $9.50 an hour).

Total estimated value of productivity gain: $20,699.12 a year.

Estimated cost of the improvement: $350.

2 Motorize horizontal movement of betatron head.

For an estimated cost of $1000 we can make available additional capacity of about 2 hours a week (at $44 an hour) with a total estimated at $4576 a year.

3 Motorize the lift of the betatron pit bridge crane.

Setup time on large castings, which must be handled on a hand-operated bridge crane, is too long. It amounts to an estimated loss of 1 hour a shift—10 hours a week.

Figuring that motorizing the lift of the crane will save 75 per cent of this time, we can gain an annual productivity worth $17,160.

Cost of the improvement is estimated between $2700 and $3000.

4 Put a portable cart for storage of numbers, letters, pens, and tape in each exposure area.

Each area requires these accessories for film identification. Current practice is to walk to a table some distance away to pick them up. A portable cart could be moved to the casting. Approximate cost: $400 for four carts. No estimate made of the payoff.

5 Assign a man to lay out and mark the castings prior to their setup in the inspection area.

Casting layout has been done in the same area that exposures are made in. This ties up the area for an average of 2 hours a shift on the betatron, 1 hour a shift on the x-ray, and another hour on the gamma.

By doing the work outside these inspection areas, we can make available increased capacity worth an estimated $54,600 a year. Cost: About $200 for an appropriate workbench.

6 Build a film sorting and reading desk, and purchase film filing cabinets.

If the proposed sorting and reading desk is built and we follow a suggested system, we could reduce film handling by over 50 per cent. Total cost for the equipment: $800. Total saving: $6000 a year.

---

for? What kinds of information should be used?

• **Example** — At Electric Steel Foundry Co., Portland, Oreg., high alloy steel castings made to rigid specifications, including 100 per cent radiographic examination, were caught in a production bottleneck in the inspection department.

Jack Sieforth, work simplification co-ordinator, and his associates found a solution.

They came up with six proposals aimed at increasing productivity of inspection equipment. They were designed to eliminate the wait (as long as an hour) while the operator traveled from the inspection area to the darkroom (250 ft from the betatron) to process and read radiographic plates. During the wait, the inspected casting remained set up, tying up the betatron.

The proposals also were designed to make the betatron more maneuverable, to cut the layout and setup time, and to speed film handling and sorting.

Mr. Sieforth and associates told top management:

"The changes recommended, when put into effect, should increase the utilization of the equipment and personnel of the department. It is estimated we can handle almost twice the work we could before work simplification, with the same manpower.

"The cost of putting these changes into effect can be recovered in the first three weeks and will improve our competitive position with regard to delivery and cost."

• **Balance Sheet**—The six suggestions represented a total investment of about $5750. They offered an estimated gain in productivity worth $103,815.12 a year.

The plan was O.K.'d. It worked!

Thin-rimmed pulley (right) shows lightweight castings possible with ductile iron

Right Materials Boost Drive Speeds

Tougher, lighter ductile iron pulleys, with stronger, narrower leather-plastic belts, increase safe operating speed of paper company's taper-cone system

THE SAFE operating speed of taper-cone pulley drives was increased 50 per cent by Scott Paper Co., Chester, Pa., through the use of ductile iron pulleys and leather-plastic belting.

Problem: The tensile strength of cast iron pulleys and leather drive belts was holding the speed limit at 6000 fpm. The choice: Find stronger materials, or buy an expensive gear unit, says A. W. Hilliard, paper mill design engineer.

• **Pulleys**—Scott switched to 60-45-10 ductile iron pulleys. They were cast by T. B. Wood's Sons Co., Chambersburg, Pa., under license from International Nickel Co. Inc.

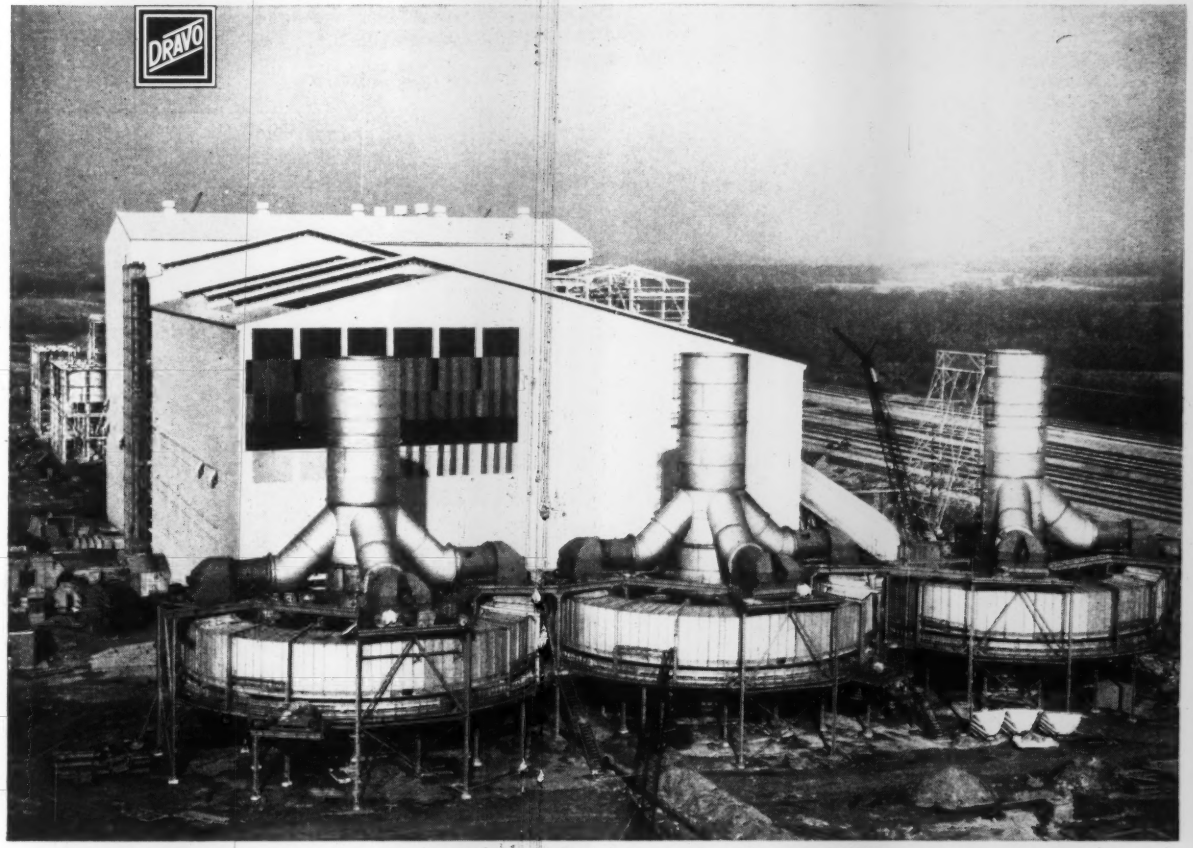
Ductile iron, like cast iron, has good fluidity, is easy to cast, and is easy to machine. Like steel, it has high tensile strength, is tough and ductile.

Ductile iron shims were used to separate the two halves of the pulleys during casting. Hot metal poured into the mold did not knit with the cold metal of the shims. The shims separated the casting halves so effectively that they came apart without sawing.

Lightweight construction was possible because of the material's strength. Return flanges were omitted; and lighter rim bolts and rim lugs were used.

• **Belting**—The belting has high tensile strength and high coefficient of friction.

Four-ply belts, 3¼ in. wide, replaced three-ply belts, 8 in. wide. Despite differences in width and weight, they performed better than the previous belts because of their better friction surface.



At Saxonburg, Pa., Dravo is constructing a sintering plant for U.S. Steel Corporation that will produce 15,000 tons of iron ore sinter per day.

Dravo builds country's largest sintering plants for U. S. Steel

To increase efficiency of blast furnace operations by better utilization of iron ore fines, United States Steel Corporation is building two giant sintering plants—one at Gary Steel Works, Gary, Indiana; the other at Saxonburg, Pa., north of Pittsburgh, to be operated by Edgar Thomson Works.

As exclusive U.S. licensee of the Lurgi Company (Europe's foremost producer of such equipment) Dravo is handling design—and fabrication and erection of mechanical equipment—for both installations. Each includes three sintering machines and three coolers. American Bridge Division of U.S. Steel is handling fabrication and erection of the buildings.

The U.S. Steel and other sintering projects currently under contract at Dravo underscore the growing importance of this process to the steel industry. For information on products and services listed below, write DRAVO CORPORATION, PITTSBURGH 25, PA.

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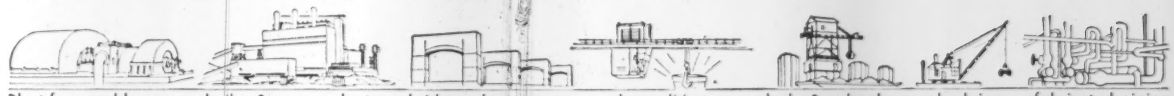

Blast furnace blowers • boiler & power plants • bridge sub-structures • cab conditioners • docks & unloaders • dredging • fabricated piping

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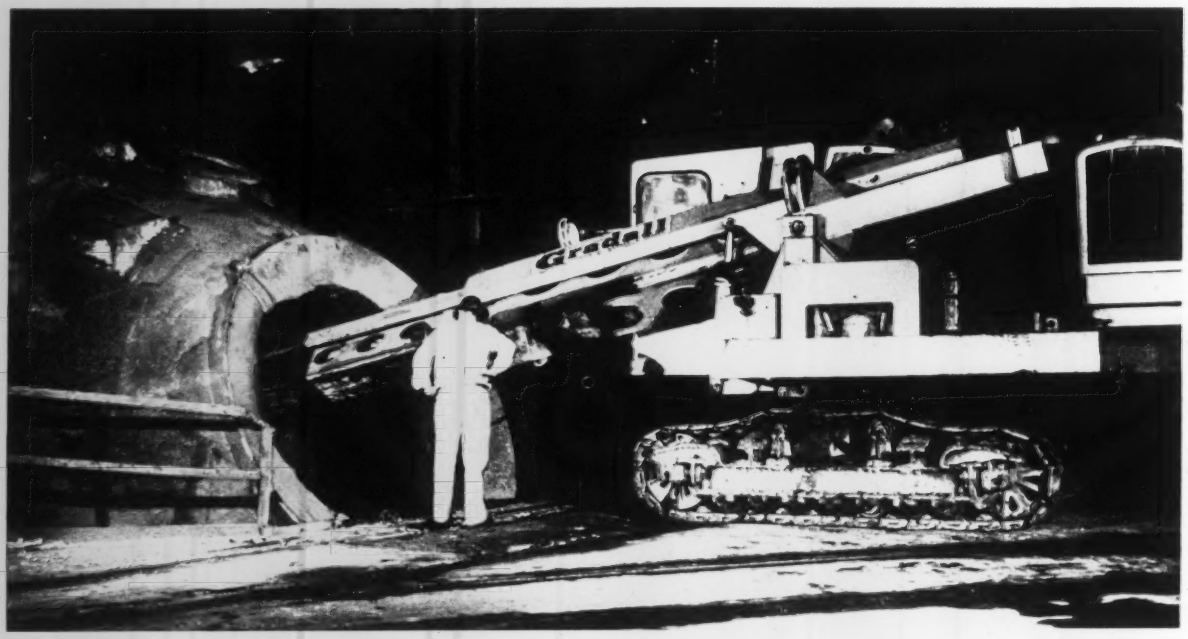


An employee at the Aliquippa, Pa., Works of Jones & Laughlin Steel Corp. watches as a Gradall digs into one of the oxygen furnaces to clean out slag and burned refractories

Construction Tool Slashes Furnace Maintenance Costs

It's creating new techniques in rebuilding open hearths and oxygen furnaces. It's also useful in cleaning slag pits, moving ferromanganese, and for handling operations

A MULTIPURPOSE earthmoving and construction machine is leveling maintenance and downtime costs in the steel industry and other metalworking fields.

It's the Gradall, made by Warner & Swasey Co., Cleveland.

• At Jones & Laughlin Steel Corp., Aliquippa, Pa., the machine reduced the time and cost of skulling out new basic oxygen furnaces by almost 60 per cent.

• At another steel plant, it trimmed the time for tearing down open hearth furnaces for relining by 73 per cent. The furnace was put back into production 16 hours sooner than previous methods allowed.

• In cleaning out slag pits, it has cut the time formerly required by nearly 90 per cent.

• At the plant of a midwest fastener manufacturer, it is used to unload coils of wire from railroad gondola cars. It reduced handling time 75 per cent and eliminated all manual labor.

• **Versatility Is Key** — The machine's usefulness stems from its many controlled movements and variety of attachments. Also, it can be mounted on a truck-type carrier, crawler, or a self-propelled carrier.

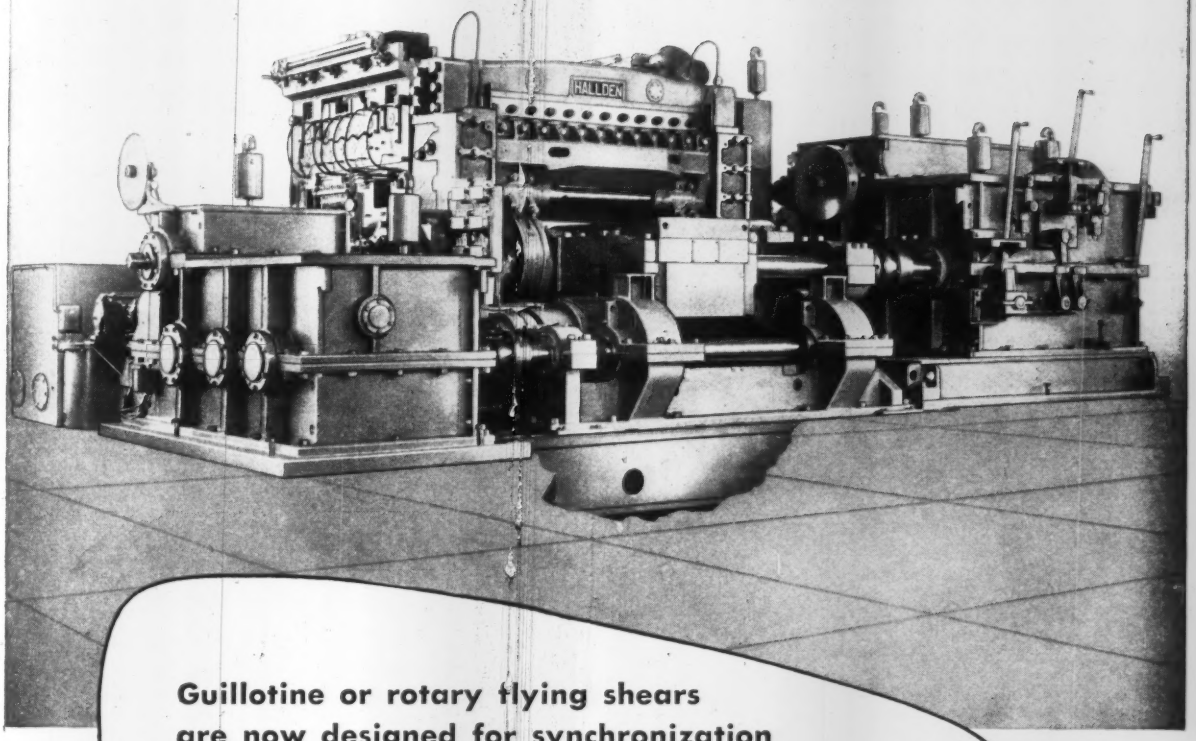
The triangular, telescoping boom which carries the working attachments, can be swung in a complete circle, raised and lowered, or tilted 45 degrees from center either way.

• **Relining a Problem**—At J&L, use of the equipment has brought about new techniques in maintenance. One of the most serious problems encountered in the high speed operations was relining the large oxygen furnaces in the short time allotted. Each of the two vessels is on the line for eight to ten days while the second is skulled out and relined with about 200 tons of refractories.

In the initial operating period, J&L employees hand-chipped the skulls, slag, and burned refractories from the furnace with hand-operated pneumatic hammers.

• **Difficulties Involved** — The employees were unable to enter the furnace for at least 16 hours after

SYNCHRONIZED *"On the Fly"*



Guillotine or rotary flying shears are now designed for synchronization adjustment without stopping the machine.

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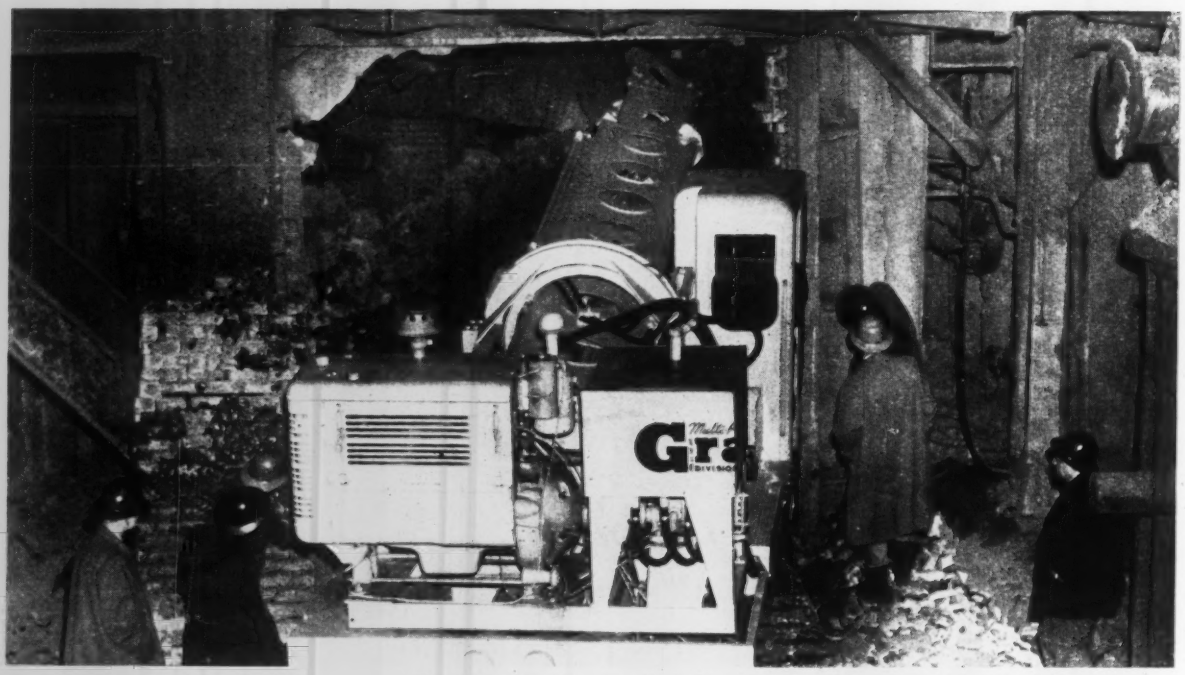
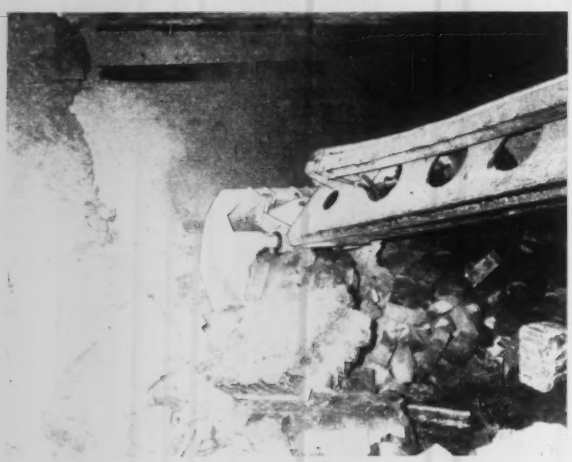
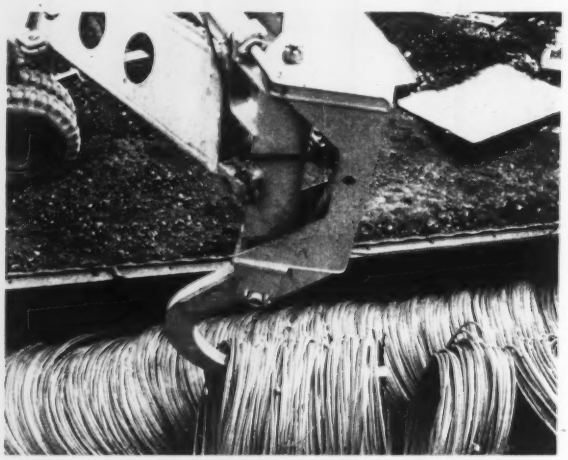


Cleaning slag pits at a U. S. Steel plant. The corporation uses the machines at its Gary, Ind., and Pittsburgh plants



Gradall digs down to the steel shell of an open hearth furnace at a southwestern steel plant to remove refractories for rebuilding



Unloading coils of wire from gondola cars with a Gradall equipped with a special attachment. No hook-up is required

it was shut down. Cleanup crews had to be spelled frequently because of the heat. Scaffolding had to be placed inside the furnace and shifted often. The scrap material had to be hoisted out by hand or crane. Exterior cleanup of the furnace had to be delayed for the safety of the men working inside.

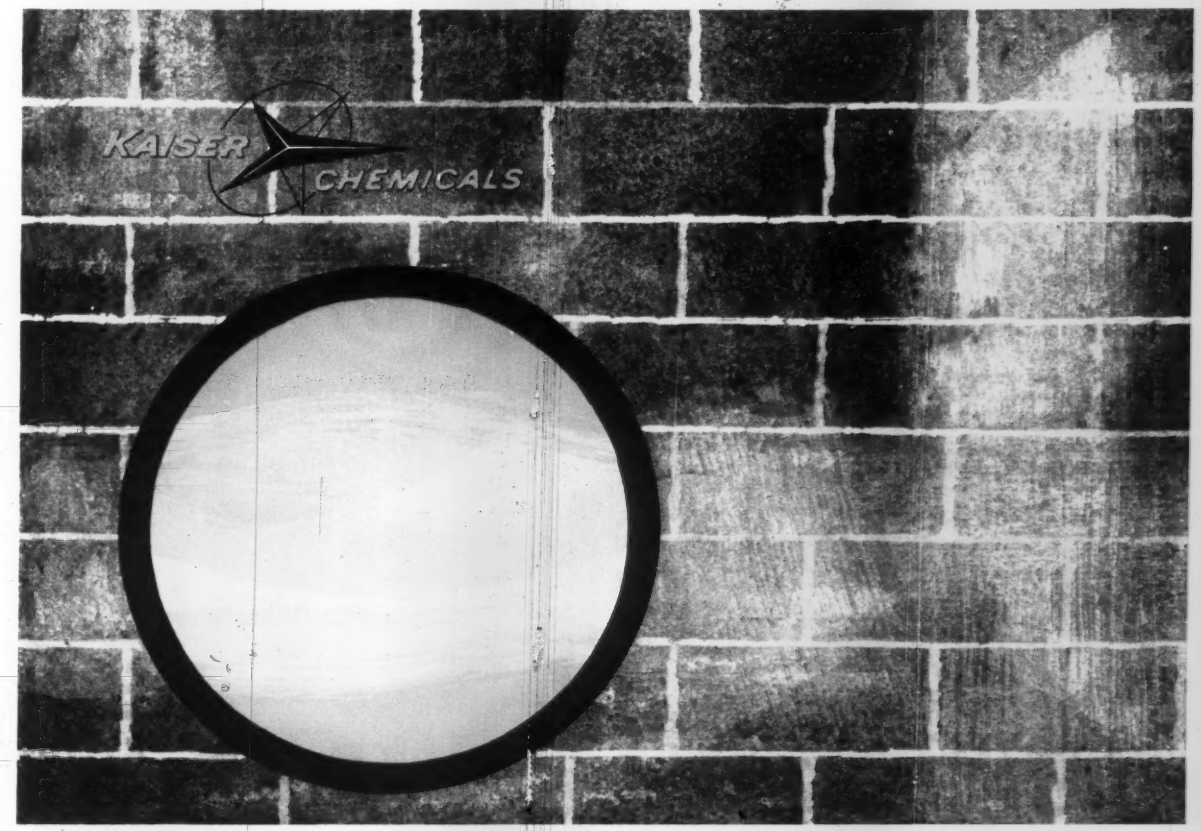
Cleanup of the furnace interior required 48 to 60 hours. With 60 hours more needed for relining, officials found they could scarcely complete the relining project in the allotted time.

• **Machine Turned Tide**—To give the Gradall a tryout on the job, workmen hoisted it onto the charging floor with an overhead crane and fitted it with a special ram-type pneumatic buster which J&L had designed.

The machine cut the time and cost of the operation by almost 60 per cent. It can start the cleanup 6 to 8 hours after the furnace has been taken off the line, and can clean out the interior and remove exterior scrap in about 16 hours.

• **Cleans Open Hearths**—In tearing down open hearths for furnace rebuilds, the Gradall has cut costs by as much as 50 per cent and time by more than 70 per cent.

(*Please turn to Page* 122)



Minimum hot taphole life 20 heats with Permanente 165 Ramming Mix!

Refractory Brick & Ramming Materials • K/R Gunning Systems
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20-25 heats: "Installed Permanente 165, and now taphole life has gone up from 3-5 heats (competitive mix) to 20-25 heats."

23½ heats: "Taphole life in the big shop is up to 23½ heats with Permanente 165. Everyone is well satisfied."

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Operators who have switched to Permanente 165 Ramming Mix consistently report hot taphole performance like this—*more proof* of the time-saving and money-saving advantages you gain with Kaiser Basic Ramming Mixes!

Permanente 165 is made from high purity Kaiser Periclase refractory grains (94-96% MgO) and ceramically bonds itself into a crystalline mass at relatively low temperature, providing fast furnace availability. When "cured," this mass becomes a monolithic structure with exceptional volume stability, maximum resistance to hydration and to attack by iron oxide and slag. For furnace bottoms, its installed high density (averaging 175 pounds per cubic foot) assures longer life.

Make your own comparison test and see how much more life you get with Permanente 165 Ramming Mix. Your Kaiser Chemicals Sales Engineer will be glad to help.*

*Ask for details on the new K/R Gunning System.

Call or write Kaiser Chemicals Division, Dept. S8252, Kaiser Aluminum & Chemical Sales, Inc., at any of the regional offices listed below:

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HAMMOND, IND. . . . . 518 Calumet Building
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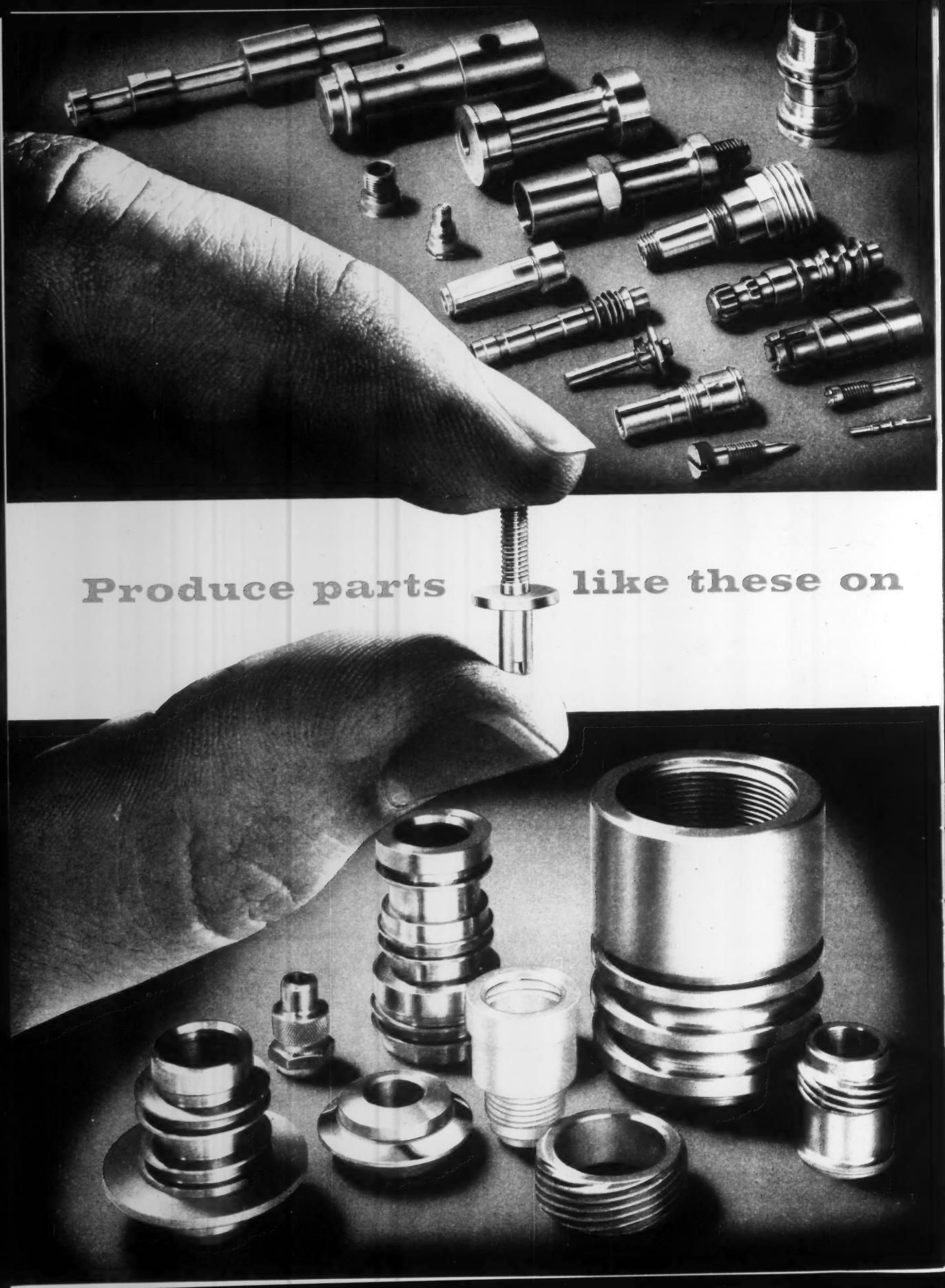
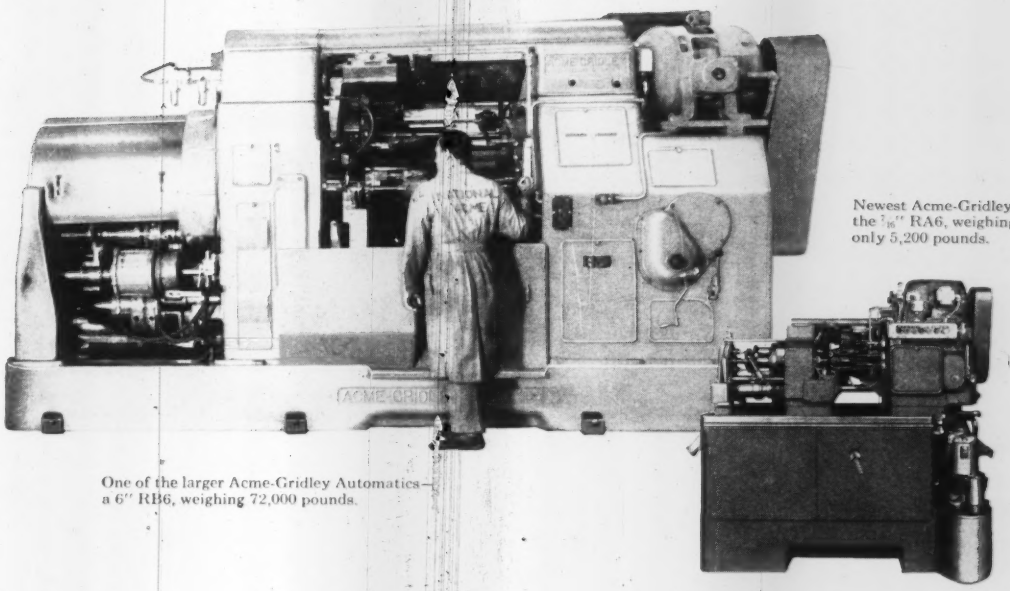

Produce parts like these on



Newest Acme-Gridley—the 7/16" RA6, weighing only 5,200 pounds.

One of the larger Acme-Gridley Automatics—a 6" RB6, weighing 72,000 pounds.

ACME-GRIDLEY automatics . . .

FORGET SECONDARY OPERATIONS!

Most parts machined on Acme-Gridleys are *completed* on Acme-Gridleys. Using these Automatics, you eliminate costly rehandling and, in many instances, avoid a sizeable second-machine investment.

The advantage applies to parts weighing fractions of ounces or hundreds of pounds. And the wide-open tooling zone of every Acme-Gridley lends itself to a broad range of installations limited only by the tool engineer's ingenuity. It means that, for sheer capacity range, no line of automatic production equipment in the world equals Acme-Gridley.

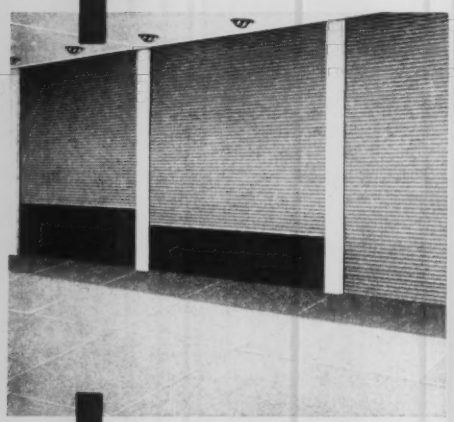
If you produce parts like the ones illustrated, then Acme-Gridley Automatics must be in your present plans. Our representative can give you expert assistance without obligation.

National Acme

THE NATIONAL ACME COMPANY, 189 E. 131st ST., CLEVELAND 7, OHIO • Sales Offices: Newark 2, N.J., Chicago 6, Ill., Detroit 27, Mich.

Best Answers for Doors, Passageways, Other Openings:

KINNEAR ROLLING DOORS,* FIRE DOORS, GRILLES



Coiling upward action is Kinnear's key to highest efficiency. It assures maximum space economy: *all floor and wall space around the opening is fully usable at all times.* Headroom and ceiling-space requirements are negligible (the barrel on which the closure coils when opened can in most cases be set within the wall either *below* ceiling height, *at* ceiling height, or *above* ceiling height). Motor, chain, crank or manual-lift is available, to suit any operating needs. In all cases, the closure rises completely out of the way when opened.

KINNEAR ROLLING DOORS protect openings with a continuous curtain of interlocking steel slats *(a Kinnear first)* — full door efficiency plus protection against wind, weather, intrusion, and fire.

KINNEAR ROLLING FIRE DOORS have features added to the steel-slat curtain operation that bring positive, automatic, safely controlled closure in case of fire, plus extra fire-blocking capacity approved by Underwriter's Laboratories, Inc.

KINNEAR ROLLING GRILLES, a combination of rugged steel bars and links fully protect openings against trespass, without blocking light, air, or vision.

All three of these Kinnear upward-acting closures can be used in various combinations, and are built to fit openings of almost any size. *Write today for full details.*

***Also doors of modified design, available as COUNTER SHUTTERS**

KINNEAR ROLLING DOORS
Saving Ways in Doorways

The KINNEAR Mfg. Co.

FACTORIES:
1780-1800 Fields Avenue, Columbus 16, Ohio
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Offices and Agents in All Principal Cities

CONSTRUCTION TOOL . . .

One mill reports savings in six weeks equalled cost of the machine.

Cooling time has been cut from 12 hours to 3 or less. The crew required to tear out the old lining has been drastically reduced, but the job is done much faster.

Generally, he rips and pulls the bricks and other material toward the front of the furnace. After gathering up the material, he backs up the machine to permit easy swing and loads out the refuse.

• **Cleans Slag Pits**—This is a particularly tough job for steel mills. The material is hard and is fairly hot. At the same time, it lies under expensive brickwork.

Generally, a single tooth ripper is used to break and rip loose the slag. The quick changeover to a bucket lets the operator load out the material.

The Gradall is also effectively used in many mills for cleaning checkers. One southern mill rebuilt a portion of its open hearth operation to permit use of the machine for this chore.

• **Loads Wire Coils**—At a fastener manufacturer's midwest plant, another use was uncovered: Unloading coils of wire from gondola cars and stacking them for storage or loading them onto fork trucks for delivery into the plant.

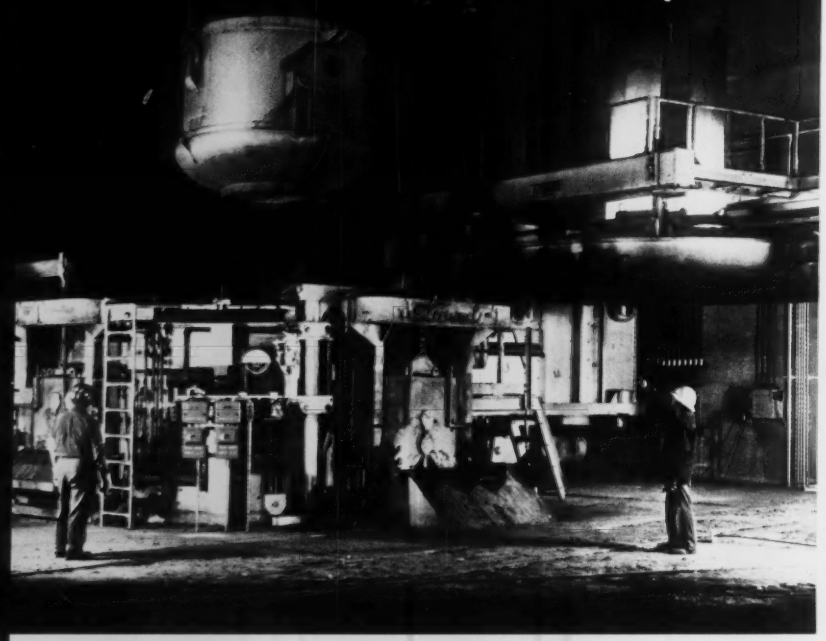
One load of 133 coils can be unloaded in 23½ minutes of operating time. Total time, including spotting and moving the Gradall, is 30 minutes. The old method of using a crane and two men for hookup required 1 to 2 hours.

• **Other Uses**—The Duquesne Works of U. S. Steel, Pittsburgh, acquired a Gradall to remove ferromanganese that has been cast into special gondola cars.

In mill yards, the machines have been used for cleaning track, cleaning ore and slag around overhead bridges and cranes, maintenance of roads in the mills, and cleaning of drainage ditches along the roads. They are also frequently used for repair of utility lines, construction of new facilities, and other material handling functions.

• An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.

THE POUR IS "VACUUM CLEANED"
at ERIE FORGE & STEEL . . . .



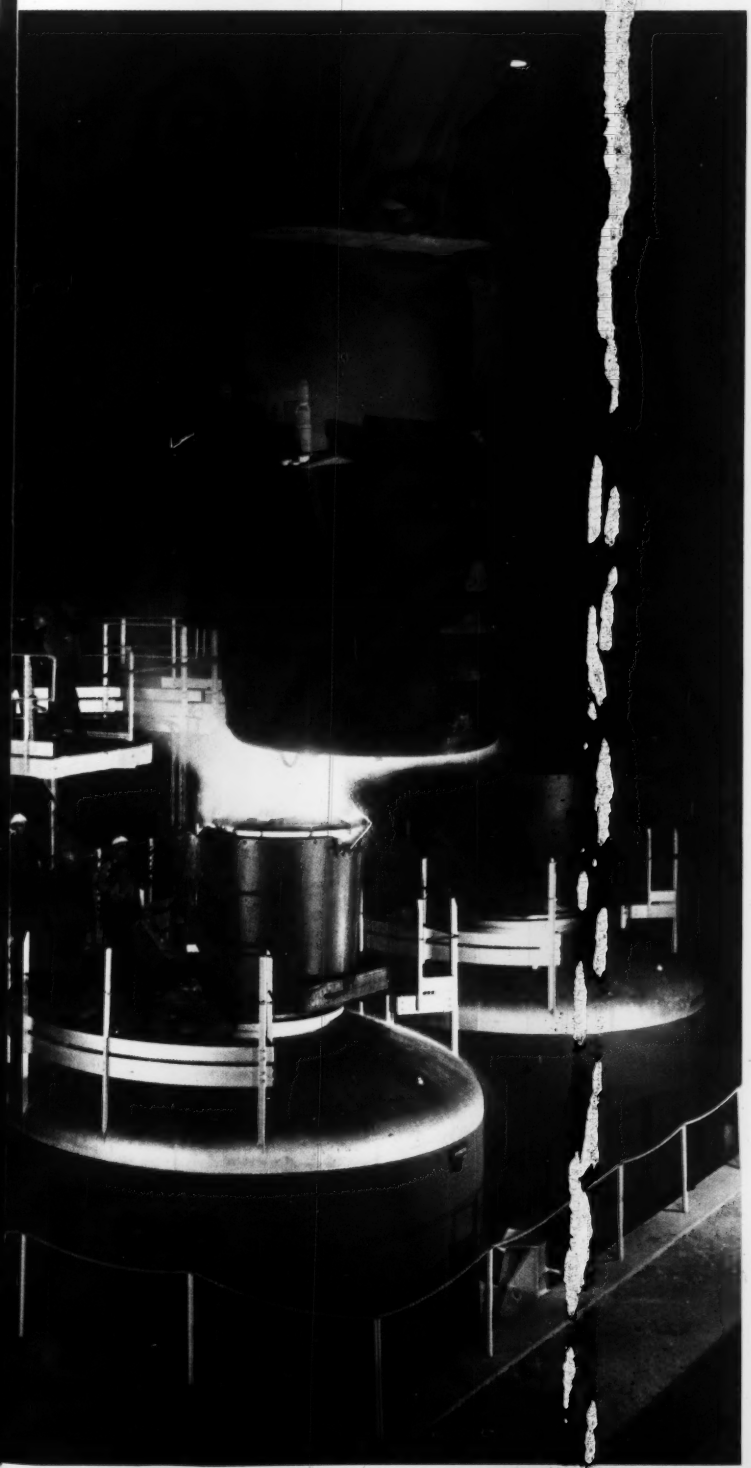
Charging Operation

Pouring Operation

75 TON ELECTRIC FURNACE

Color Photography by Joseph Balbuza

ELECTRIC FURNACE STEEL teams up with VACUUM CASTING at Erie Forge & Steel



Sired by The Electric Furnace Out of the Vacuum Chamber . . . Purebred Steel!

You are looking at the birth of a thoroughbred . . . *cleaner, tougher, more ductile steel* . . . product of purity of line . . . with rugged strength inbred.

Here is steel designed for the most demanding jobs in the diverse industries of the world . . . steel from raw materials carefully balanced metallurgically for the electric furnace charge.

Here is quality control in its finest form *before* the birth of the ingot. At the precisely predetermined second the melt leaves the electric furnace to be transferred to the vacuum chamber where the ingot is cast . . . an ingot which, when forged to specifications, heat treated and machined, may be the rotor at the heart of a high speed power turbine.

Cleaner, Tougher, More Ductile Steel for the special demands of industry is born here.

ERIE FORGE & STEEL CORPORATION
ERIE, PENNSYLVANIA

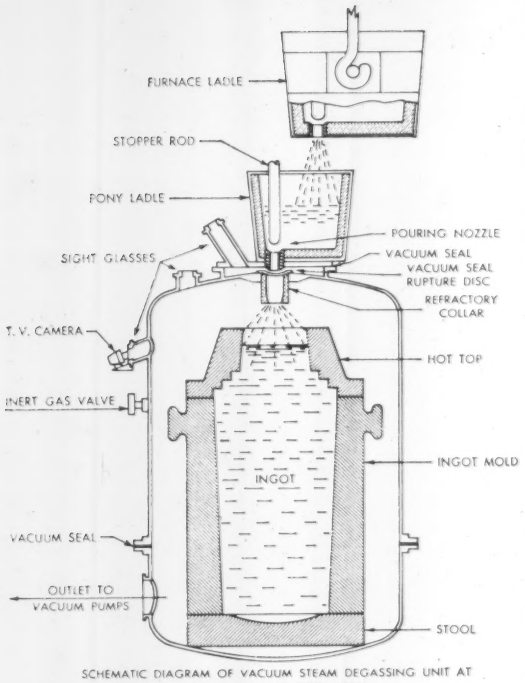
MEMBER AMERICAN IRON AND STEEL INSTITUTE

Higher Quality Steel is Born In The Vacuum Chamber . . .

Teaming the 75 ton electric furnace with vacuum casting produces the cleaner, tougher, more ductile steels which result from greater degrees of purity in the melt and in the pouring process. The jet of molten steel, discharging from the bottom of the pony ladle, melts a hole in the aluminum cover of the vacuum chamber, streaming continuously into the vacuum chamber. The absence of air in the vacuum chamber eliminates harmful gases. The result is a very minimum of hydrogen, nitrogen, oxygen and numerous volatile metals usually present. Two Television Cameras watch the operation inside the tank. One control panel, completely equipped with instruments and gauges, plus Television Screens, monitors the entire operation.

The high quality of Electric Furnace Vacuum Cast Steel meets today's demanding tests, such as ultrasonic procedures, to assure components of maximum dependability. This is but another step in the continuing program at Erie Forge & Steel to meet the needs of today's and tomorrow's industry for stronger, tougher, more ductile steels.

Complete details on Electric Furnace Vacuum Cast Steels are yours for the asking. Your problems in meeting your specific components demands will be welcomed by our technicians. Consult with us.



SCHEMATIC DIAGRAM OF VACUUM STEAM DEGASSING UNIT AT ERIE FORGE AND STEEL CORP.

Here's What We Produce:

STEEL FORGINGS FOR:

Crankshafts – Connecting rods for Diesel Locomotives – Presses – Compressors – Stationary Engines – Shafting for Naval and Maritime Vessels – Rotors for Naval and Maritime Vessels – Power Plants – Ordnance, Presses & Steam Hammers.

INGOTS

Basic and Acid Openhearth, Carbon, Alloy and Electric Steel for suppliers who do not have steelmaking facilities.

STEEL CASTINGS FOR:

Steam Hammers – Ship Castings – all types of large Presses – Rolling Mills – Hydro-Electric Engines – Steam Turbines – Crushers – Kiln Castings for Aluminum – Nickel – Tin – Magnesium and Cement Mills.

Your Nearest Erie Forge & Steel Sales Office is Listed Below

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Lancaster, New York
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Control Ups Grinder Output

If you've been looking for a way to boost the production of your centerless grinders, here's a tip from the Spaulding Works of Crucible Steel Co., Harrison, N. J.

That company doubled its production of magnets for radio and television sets with the help of an automatic control system developed by Radio Corp. of America, N. Y.

Lloyd F. Bowne, assistant superintendent of Crucible's special product division, says that before the grinder was equipped with the control system, one man produced 4800 finished magnets an hour.

All tolerance checking was done manually.

The automated machine can finish 9600 magnets an hour under the part time supervision of one operator. Each magnet is gaged for proper size automatically and out-of-tolerance parts are returned to the feeder system for a rerun through the grinder.

The grinder control system can be used on a variety of jobs, says RCA. It can be shifted to other machines of similar design, and a switch permits use of the grinder with or without the automatic features.

Teflon Sealed in Metal

A new, low cost process for impregnating moving parts promises to reduce wear and costly replacement.

Developed by Western Sealant Co., Culver City, Calif., the process seals the microscopic pores of the metal with Teflon which provides a self-contained lubrication for the parts. The impregnation eliminates the possibility of initial starting damage if additional lubrication is tegral part of it.

• **Sealant Forms Bond**—The Teflon is bonded into the metal as an integral part of it.

It cannot bleed out under friction, heat, or pressure.

In many cases of light contact between parts, Teflon can act as the complete lubricant. Also, where there is a partially or wholly open contact between surfaces, Teflon disposes of the use of grease-type lubricants which could hold damaging dirt or grit.

Machine Tool Standards Can Be Good or Bad

The long-run effects of the building block approach to standards for special machines will depend mostly on the user. He can make it or break it

STANDARDIZATION of special purpose machine tools is on the way, may come during 1959. For the most part, you'll like it.

Proponents of the still-controversial building block approach to special machines are right when they say it will add flexibility to production lines.

Standardized mounting surfaces and bolting pattern of machine components will let you hook an ABC vertical column to an XYZ base, or add one maker's work station to another's rotary table. It means that when you're through with a group of three or four single purpose machines, you can take them apart and reassemble the elements into new combinations for new jobs.

• **Benefits** — The most significant advantage of the new standard for the average metalworking shop is this: You can find it practical to use single-purpose machines where they could not pay off before.

For example, take one of your products that you may not be making two or three years from now. If you have to figure that a special machine must pay for itself in that period, then be scrapped, you probably couldn't justify it.

If the machine components are standard and can be shifted to make a new machine when you need it, you can permit a longer payoff and generally can justify buying the machine.

• **Jekyll and Hyde**—Whether the standard will be good or bad will depend mostly on the users. If it's treated as a cost-cutting tool, it will be good—for the reasons already cited.

But machine tool builders against it fear overstandardization. Reason: It can put a damper on design progress.

Can it?

It can and here's how. A little over a year ago, a plant manager in a multiplant corporation bought an automatic machine that first gages the parts, then assembles them into a mating part of the right size classification.

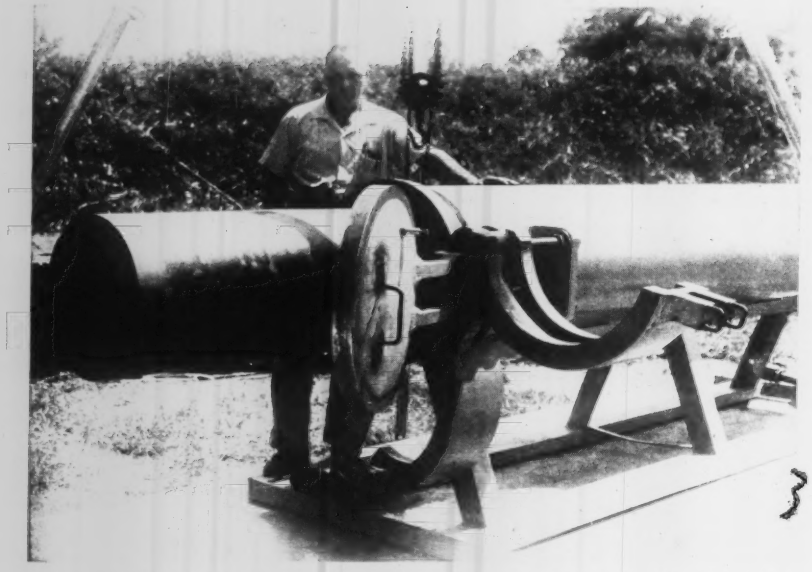
His corporation specified that all assembly machines use control systems built to a well-known electrical standard. The control panel for this machine was about 10 ft long, 2 ft wide, and 7 ft high. It took up 20 ft of productive floor space—and was built to standard.

About the same time, in another of the corporation's plants, another manager bought an identical machine to do an identical job. He called it (on paper) an inspection device, which freed him from the electrical standard. Thus freed, the equipment maker developed an electronic control that was simpler, more reliable, and less expensive—and it mounted directly on the machine, using no additional floor space.

• **Obligations**—As users put their heads together to agree on machine standards, builders will go along. Special machines will be quoted and sold on the basis of the new specifications. And the users will have to expect to pay their share of what it costs a builder to convert to the new specs.

Then you'll owe yourself, your company, and its stockholders one more thing:

Use the standards as a tool—not as a crutch.



A large casing for a rocket booster is explosively formed in this die which weighs some 14,000 lb. Part is shown being withdrawn. Solid rocket fuel provides lightning force

Explosive Forming Tackles Big Tube

ADD another case history to the growing list of parts produced by explosive forming (STEEL, Aug. 25, p. 82):

Chromalloy Corp.'s Propellex Div., Edwardsville, Ill., blows 11-ft rocket booster cases into shape in a fraction of a second. A side benefit: Metal strength is increased 30 per cent.

• **Principle**—The method employs an explosive charge and a shock transmitting medium (often it's water). They are put in a constraining die with the part being formed. The tremendous force of the explosion moves the metal into the die cavity.

Part size at first seemed to be against successful development of the technique. Only comparatively small items had been tested.

The Chromalloy die assembly weighs around 14,000 lb. A solid rocket fuel called Propellex furnishes the kind of power needed.

• **Interpretation**—"Explosive forming can mean considerable reduction in capital investment for many industries," says Dr. Robert Cooley, Chromalloy's executive vice president. "The secret to its economy is the simplicity with which you can get precise movement of metal. The increase of metal strength also paves the way for a weight reduction of structures."

Refractory metals (chromium, molybdenum, titanium), which are difficult to form conventionally, respond excellently to this forming method. Experimental tests show that brittle metals are formed plastically at high speed by explosives.

Dr. Cooley sees wide industrial application in the near future. Chromalloy plans to provide technical information, supervisory engineering services, and the explosive charges to interested firms.

Alloy Stands Up to Wear

A new aluminum-bronze material offers improved performance when used for wearplates, slides, and gibs in machine manufacture and maintenance.

Known as Meier Wearite, the material is produced in rectangular forms by extrusion or semicontinuous casting. It has uniform chemical structure and physical properties, smooth surface, good wear characteristics, and excellent machinability.

Produced by Meier Brass & Aluminum Co., Hazel Park, Mich., the alloy also exhibits resistance to corrosion and good fatigue characteristics.

It comes in two grades containing different proportions of aluminum and copper with a small amount of iron. Tensile strengths range from 70,000 to 105,000 psi with yield strengths of 40,000 to 65,000 psi and a Brinell hardness range of 187 to 307.

Iochrome Has High Purity

Iochrome, a form of chromium metal, is being produced with impurities so low that they rarely exceed ten parts per million.

The iodide chromium process by which it is made will undergo further research and development. A program for expanded production also is planned as the result of increased demand. These facts were jointly announced by Chromalloy Corp. and Chilean Nitrate Sales Corp., both of New York.

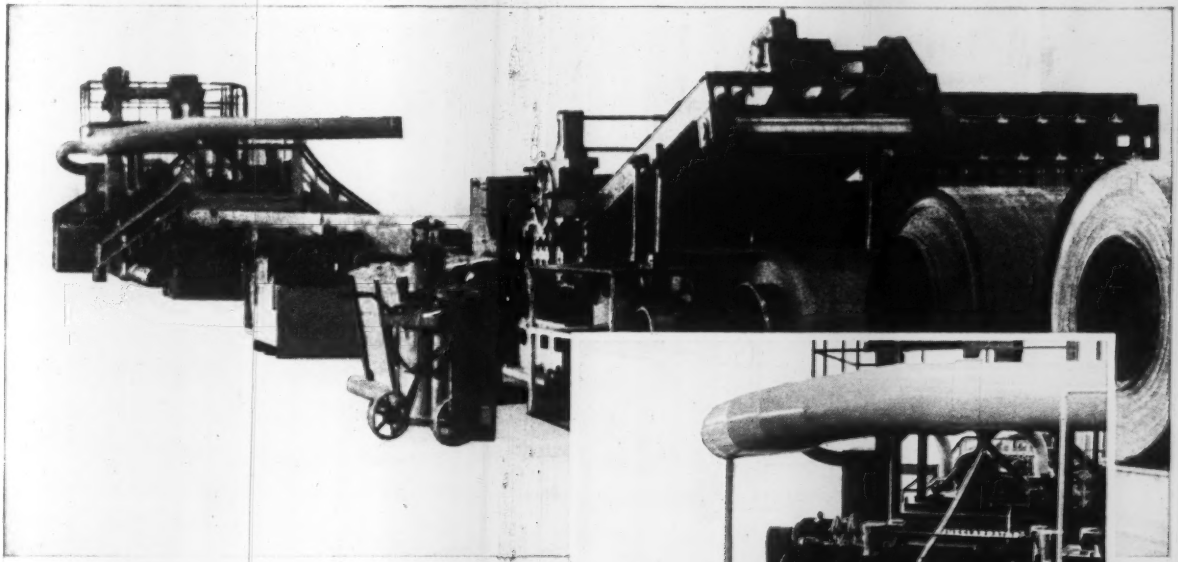
The metal is available now only in limited quantities.

Chromalloy officials believe that as volume increases, iodide chromium can be made at substantially lower cost than that of other metals produced commercially by the same process.

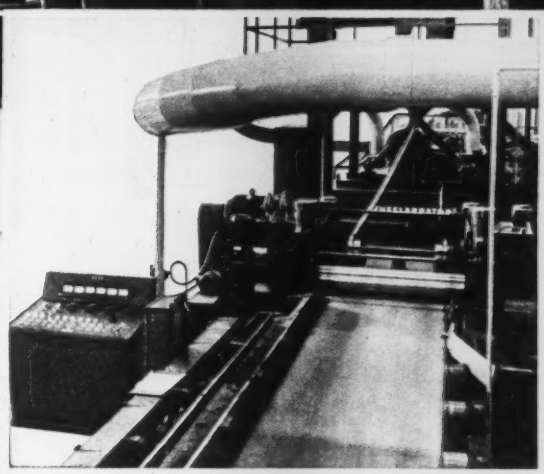
The program will be carried forward in co-operation with Battelle Memorial Institute, Columbus, Ohio, where it was initially investigated.

Iodide chromium has been used extensively in developing improved chromium-containing alloys for high temperature service in the gas turbine and nuclear reactor fields.

Stamco * heavy gauge feeding equipment and trimmers



CONE PAYOFF STRIPPER, FLATTENER AND SHEAR



SIDE TRIMMER AND SCRAP CUTTER

LAY YOUR SHEETING PROBLEMS AT STAMCO'S DOOR

Stamco has the equipment you need. If you use trimming units, plate shears, slitting units, coil openers, or ANY OTHER SPECIAL steel mill equipment, you will be money ahead if you contact STAMCO. Call or write us today. No obligation.

STAMCO, INC., NEW BREMEN, OHIO, U.S.A.

Aluminum cooling plate is secured inside refrigerator with aluminum screws. Inset: Some types of aluminum machine screws and bolts

For Aluminum Fabricating Jobs . . .

Aluminum Bolts Work the Best

They are lighter and cost less, have the right combination of strength and corrosion resistance; same metal in structure and fasteners gives product uniform look

By FLOYD A. LEWIS
Technical Secretary
Aluminum Association
New York

HOW would you like to make a lighter, longer lasting product, and trim manufacturing costs at the same time?

Try fastening aluminum structural parts with aluminum screws and bolts. They offer the same advantages of lightness, corrosion resistance, and low cost that make aluminum products attractive to both the manufacturer and the consumer.

• **Many Kinds**—These screws and bolts are available in most of the standard types and sizes; special types are made to meet special requirements.

Machine screws are available with

Tensile Strength of 2024-T4 Bolts

Size	Breaking Strength (lb)
¼—20	2025
5/16—18	3300
⅜—16	5000
½—13	8700
⅝—11	14,300
¾—10	20,750

Machine Screw Rupture Strength

Aluminum vs. Other Metals

Size	Test*	Aluminum 2024-T4	Brass	Stainless Steel 430	Stainless Steel 304
#6	Torque	10.5	11	15.2	19.5
	Tensile	596	635	775	970
#8	Torque	19	21	25.7	45
	Tensile	904	930	1099	1450
#10	Torque	27	35	45	65
	Tensile	1120	1225	1425	1780
¼"	Torque	70	76	101	133
	Tensile	2025	2050	2587	3380

*Rupture torque strength—in.-lb; rupture tensile strength—total lb

Second in a Series

Aluminum rivets and their uses were discussed in last week's issue. Aluminum sheet metal screws will be the subject next week.

flat, round, and oval heads, or with the less common fillister, pan, truss, and washer heads. Slotted or cross-recessed heads are optional.

• **Bolt Applications**—The most popular types are the hexagon-head and carriage bolts. Washer-faced, or finished hexagon-head bolts (also called hexagon-head cap screws) are used where a washer face is needed to seat against a spot faced or finished surface, in tapped holes, or where the bolt head, instead of the nut, must be turned with the wrench.

• **Material**—Screws and bolts can be made of almost any alloy, but 2024-T4 is used the most because it offers the best combination of strength and corrosion resistance for general service.

• **Holes and Threads**—Where stresses are light and there is little vibration, screw and bolt holes may be punched or drilled. With increased stress or vibration, reaming is recommended. Clearance between the hole and fastener should be held to a minimum; it should never be more than 3 per cent of fastener diameter.

Any type thread, either rolled or cut, may be used; most screws and bolts made in the U. S. have American Standard threads.

• **Using Aluminum Screws**—Aluminum screws compare favorably with those made of brass and stainless steel. The 2024-T4 types may be used size for size to replace brass screws; aluminum screws should be one size larger than the stainless steel screws they replace. In some cases, though, a larger size may not be necessary because the steel fastener had greater strength than necessary.

Lubricants reduce friction as the screws or bolts are tightened, compensating for the limited torque rupture strength of aluminum.

Torque must be controlled more closely than with steel or brass because there is less warning before failure.

• **Design Factors for Bolts**—In most assembled products, these bolts offer no special design problems, and standard bolting procedures may be followed.

Where high working stresses are involved, several bolts should be assembled with a torque wrench, under working conditions, until failure occurs. Torque applied to bolts in production should be no more than 70 per cent of the breaking torque determined by test.

At equal torque, aluminum bolts have greater clamping strength than their steel counterparts; for a given clamping load, steel requires almost twice as much torque.

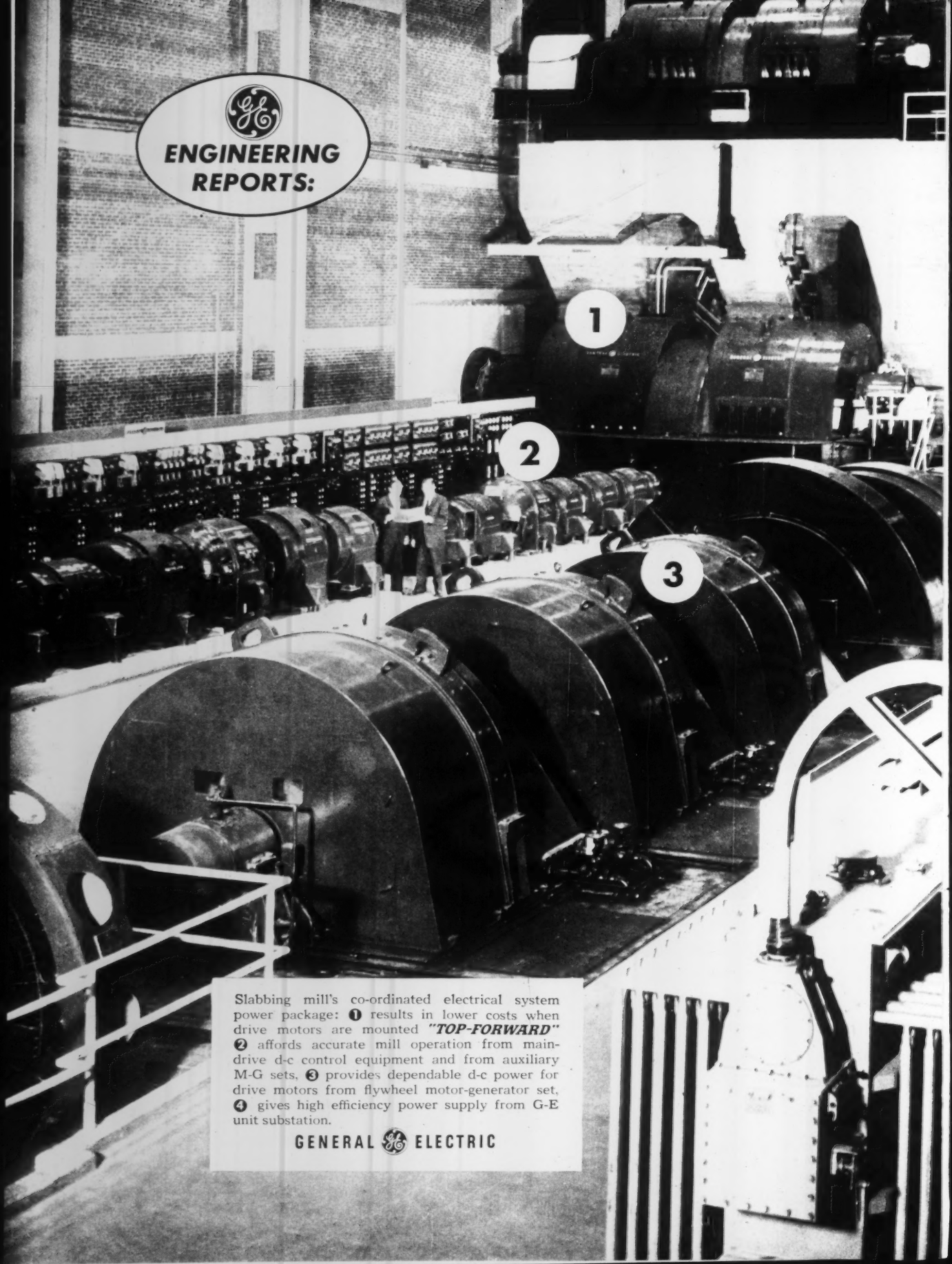
Because of variations in friction (involving such things as roughness of clamped surfaces and thread lubrication) trial under service conditions is a more reliable guide to correct torque than any table of recommended torque strengths.

• **Nuts and Washers**—Many kinds of nuts are available; the hexagonal types are the most popular.

Large nuts should be made of 6061-T6 because it has greater resistance to corrosion (including stress corrosion) and develops the full strength of the bolt.

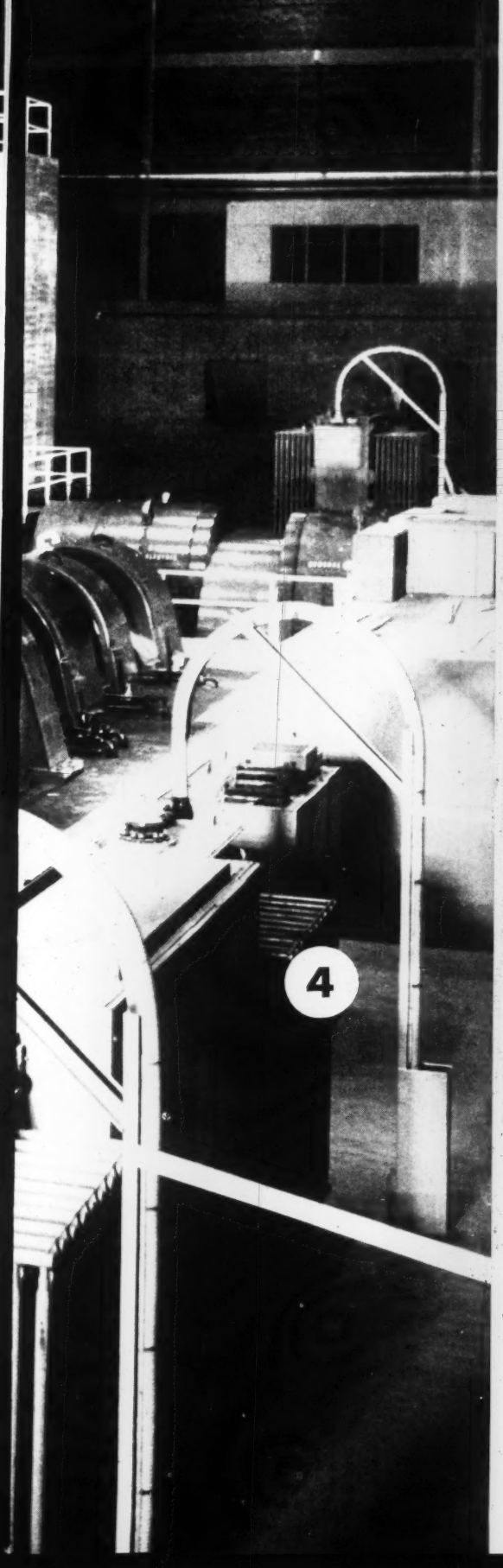
Three basic types of washers are used: Plain washers protect parts from mechanical damage, spread the load over a wider area, and improve appearance; finishing washers improve appearance; and spring lock washers secure joints subjected to vibration.

• An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.



Slabbing mill's co-ordinated electrical system power package: ❶ results in lower costs when drive motors are mounted ***"TOP-FORWARD"*** ❷ affords accurate mill operation from main-drive d-c control equipment and from auxiliary M-G sets, ❸ provides dependable d-c power for drive motors from flywheel motor-generator set, ❹ gives high efficiency power supply from G-E unit substation.

GENERAL ELECTRIC



New General Electric Drive System . . .

Lowers Installation, Maintenance Costs

A new General Electric DC Drive System for reversing mills incorporates unique features designed to save considerable installation and yearly maintenance expense. With the G-E design, large twin drive motors become easily accessible—this means less maintenance expense. And, with ventilating equipment "built-in", foundation and other installation costs are reduced. Modernization of obsolete mills becomes more economical than ever before.

Now in operation at an Eastern mill, the new drive system resulted from an extensive G-E engineering study into previous construction and maintenance procedures. The new ***"TOP-FORWARD"*** arrangement, for example, places the top motor nearest the mill, with the rear motor shaft passing under the forward motor. Result: servicing time is reduced. Design of quick-removable motor covers permits faster servicing, with a minimum of effort.

These revolutionary ***"TOP-FORWARD"*** mill motors with extra value features available now, combine with other electrical system components to give one of the fastest and most accurate drive systems now available to the metal rolling industry.

G.E. is ready to work with you to provide the most advanced quality-engineered electrical equipment for your mill applications. Your nearest General Electric Apparatus Sales Office will give you complete information. Write for GEA-6812, DC Drives for Metal Rolling to General Electric Company, Schenectady 5, N. Y. 659-122

Engineered Electrical Systems for Steel Mills

GENERAL ELECTRIC

CARBO-SIL® No. 4*

The Only Low-cost and Consistent Method of Adding Silicon Carbide in Your Cupola

A positive silicon source that:

- Cuts Costs
- Increases Machinability
- Improves Fluidity
- Controls Chill

CARBO-SIL No. 4, a silicon carbide addition for cast iron cupolas, comes in 10 and 15-pound units encased in steel containers.

BECAUSE CARBO-SIL No. 4 comes in steel containers, every crystal of the precrushed silicon carbide is *fully* protected until it reaches the significant melting zone of the cupola. Then it *completely* reacts and goes into solution.

CARBO-SIL No. 4 is competitively priced with silicon carbide in briquette form. You save money because there's no waste. If briquettes are made sturdy, they only partially dissolve and often are found in the drop. If made fragile, they break up prematurely and are partially blown out the stack.

There are 4½ pounds of available silicon (as silicon carbide) in the 10-pound unit and 6¾ pounds in the 15-pound unit. Each container adds almost a pound of steel to your charge at no extra cost.

Write for details.

Safe Outdoor Storage

CARBO-SIL No. 4 is packed in palletized, waterproofed and top-strapped units for space-saving outdoor storage.

AMMET

AMERICAN METALLURGICAL PRODUCTS COMPANY

3600 FORBES AVENUE / PITTSBURGH 13, PA. / PHONE MUSEUM 2-7031

Machine Provides Rapid Operation and Quality Plating

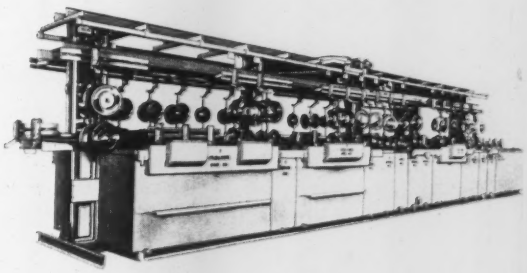
The high speed Uniline machine operates continuously to produce high quality plating.

With a production capacity of 120 racks an hour, the unit handles the entire operation from cleaning to nickel and chrome plating.

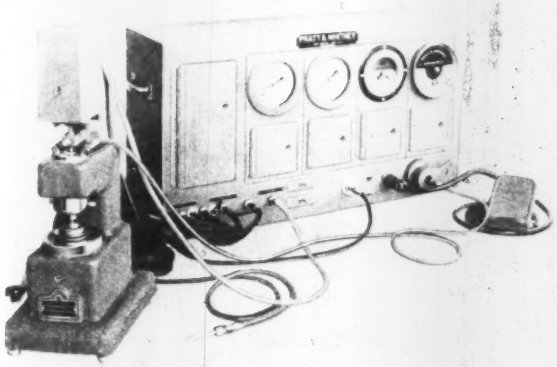
The single row machine is adaptable to a wide range of cycle and production requirements, including high lifts and wide or narrow racks.

Special carriers transport full rack load on steel rollers with permanently lubricated bearings.

The unit offers reliability of operation, ease of maintenance, and minimum space requirements. *Write*: Meaker Co., 1633 S. 55th Ave., Chicago 50, Ill. *Phone*: Bishop 2-1920



Gage Checks Preload and End Play of Ball Bearings



The Air-O-Limit Preload-End Play Gage is a quick responding, accurate device for checking the preload and end play of miniature and instrument bearings.

Checking statically and dynamically, the gage gives the relative "face flushness" of the bearing races.

Bearings from 0.040 in. bore through 1 in. OD can be checked to a direct reading of 20 millionths on the preload scale, and 0.0005 on the end play scale.

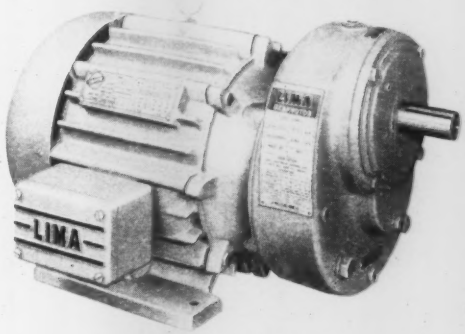
The device uses back pressure created by restriction of air flow to check the position of the inner race relative to the outer race under varying axial loads (preload), and the axial displacement of the inner race under load reversal of the given magnitude (end play). *Write*: Pratt & Whitney Co. Inc., West Hartford 1, Conn. *Phone*: Adams 3-7561

Gear Motors Provide Single, Double, and Triple Reduction

Lima Gearmotor capacities are rated from 1 to 125 hp with output reduction speeds of 780 to 7½ rpm. They are adapted for horizontal foot mounted applications.

Designed to meet almost any service requirement, they are available in standard open drippproof construction for general purpose use, totally enclosed fan cooled for dusty or high humidity atmospheres, and explosion proof for hazardous locations.

Standard electrical characteristics: Normal torque; 3 or 2 phase; 60 cycle; 208, 220/440, or 550 volts. Special voltages and frequencies, and mechanical modifications are available. *Write*: Dept. 149, Lima Electric Motor Co. Inc., Lima, Ohio.

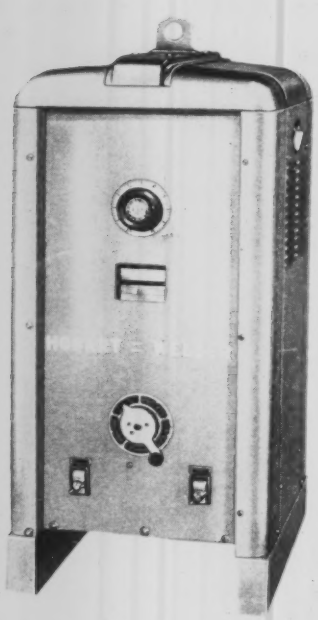


NEW PRODUCTS and equipment

Welder Is Inexpensive

The Budget 500, alternating current transformer type arc welder is rated 500 amperes at 40 volts on 60 per cent duty cycle.

Three coarse adjustment steps, with rheostat for fine adjustment, provide dual control for choice of open circuit voltage to suit the job.

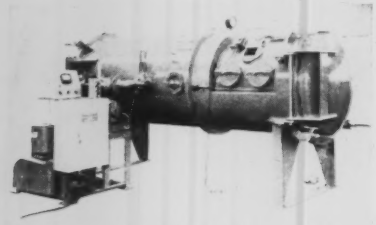


The transformer is the shell type, using the "diverter path" principle. A double primary provides operation on 230 or 460 volts. *Write*: Hobart Bros. Co., Hobart Square, Troy, Ohio. *Phone*: Federal 2-1223

Welds Reactive Materials

A versatile, inert gas, welding machine for production welding of reactive materials such as zirconium, tantalum, and columbium is designed for manual or semiautomatic use.

The Type 742 has dual welding positions with glove ports, sight glasses, automatic welding shields, and lights. A high speed, high vacuum pumping system is provided. *Write*: General Vacuum Corp., 400 Broder St., East Boston 28, Mass. *Phone*: Logan 7-8800



Indicator Extends Range

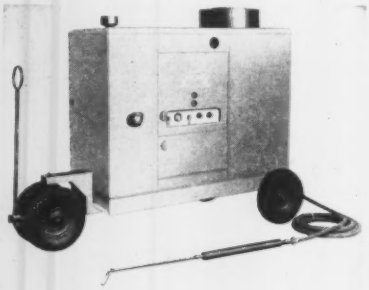
The No. 230 P-3 portable electronic test indicator provides measuring ranges of ±0.001 in. with 0.00005 in. graduations, and ±0.0002 in. with 0.00001 in. graduations.

The instrument consists of an Electro-Probe gage head; lightweight, transistor amplifier that is battery operated; and a carrying case. Federal Products Corp., Providence, R. I. *Phone*: Stuart 1-9300

Cleans Heavy Equipment

Heavy machinery and equipment can be cleaned rapidly by the 3500 Series steam-hydraulic cleaner. Instant choice of 11 cleaning actions is possible by the movement of a single lever.

The unit's 360-gph pump delivers only the amount required for the job. Outlet pressures and temperatures are variable to 300 psi and 325° F.

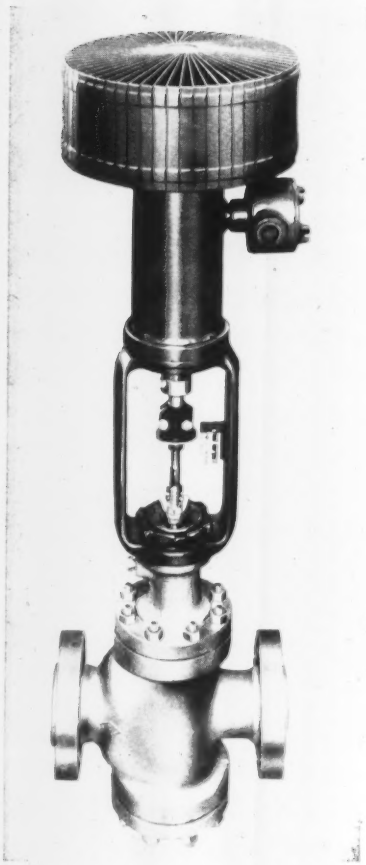


Trailer-mounted, shop portable, or stationary models are available with a choice of oil or gas for fuel. *Write*: Hypressure Jenny Div., Homestead Valve Mfg. Co., Coraopolis, Pa. *Phone*: Amherst 4-3240

Valves Positioned

The Thermo-Drive actuator utilizes the expansive force of freon vapor to position valves and other final control elements with precise and repeatable accuracy.

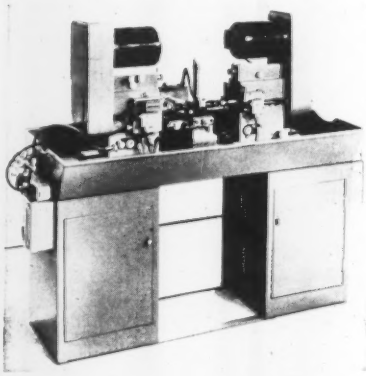
The device uses no compressed air, motors, gear trains, pumps, oil, amplifiers, or relays. It is unaffected by ambient temperatures, radiant heat, or adverse weather, and is explosion proof. *Write*: Swartwout Co., 18511 Euclid Ave., Cleveland 12, Ohio. *Phone*: Ivanhoe 1-0780



Opposed-Machining Unit

A two spindle, horizontal, opposed drilling and tapping machine handles second operations on screw machine parts, diecastings, stampings, or headed parts.

The device permits magazine or



AT A FAMOUS ORDNANCE PLANT IN NORTHERN LOUISIANA:

600-Ton Lubrication Job for Cities Service!

The huge 600-ton press above is one of several at a well known Louisiana ordnance plant operated by the Remington Rand Division of Sperry Rand Corporation.

A big machine, it naturally poses a big lubrication job...but not so big that Cities Service Pacemaker Oil can't take it in stride. With unusually high viscosity index and superior fortification against oxidation, corrosion and rust, Pacemaker is a natural for the task.

Likewise, throughout the various stages of producing artillery shells—the end product—Cities Service lubricants are hard at work.

Clearly, there's little room for error here—either in the product itself or in the machines that make it. That's why Cities Service lubricants were chosen . . . and it's an equally good reason for making them *your* choice.

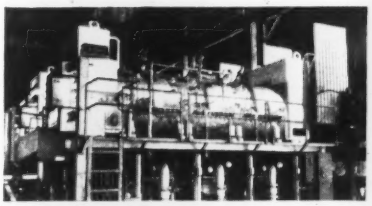
For a survey of your plant's lubrication needs, talk with a Cities Service Lubrication Engineer. Or write: Cities Service Oil Company, Sixty Wall Tower, New York 5, N. Y.

HOW THE ORDNANCE PLANT USES CITIES SERVICE LUBRICANTS

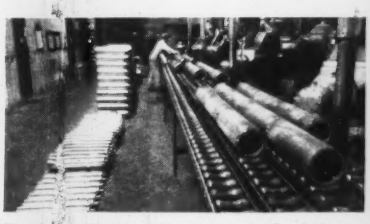
MACHINE	LUBRICANT
Large presses	Pacemaker 3 Hydraulic Oil
Airlines	Pacemaker 1
Speed reduction units	Pacemaker 6
Worm gear reduction units	Optimus 6
Package compressor units	Pacemaker 5
Metal working machines requiring a water soluble cutting oil	Chillo A
General Lubrication	Trojan Gear Oils, Trojan H-2 Grease

CITIES SERVICE

QUALITY PETROLEUM PRODUCTS



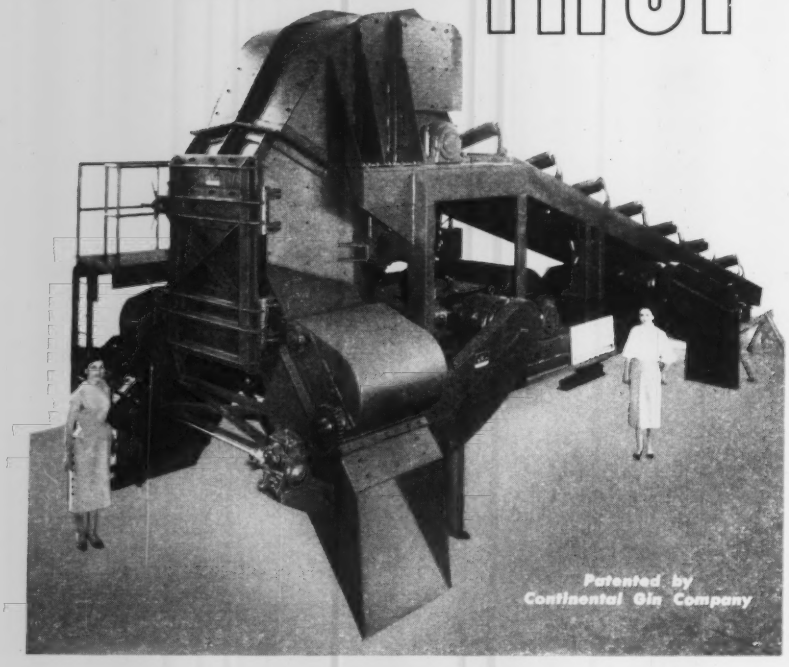
High Speed Gas Furnace heats steel to 2660 degrees F. All lubrication is supplied by Cities Service products.



Partially Finished Shells await final forming. Unusual number of forming operations are required to produce final product.

Forming Press does final forming of artillery shells. The press is lubricated by Cities Service Pacemaker Hydraulic Oil.

Another Continental "first"



Belt-Powered

Hydraulically Operated Tripper

Developed entirely by Continental, this patented hydraulic tripper was specifically designed for handling explosive, corrosive or similar materials where electric trolley wires and cable reels would present a hazard. Elimination of electrical equipment and mechanical reversing mechanisms, together with their required maintenance, make it an attractive installation for handling all bulk materials.

The unit, fully equipped with hydraulic controls, receives power from the conveyor belt and transmits this power through a hydraulic system to the tripper wheels. There are no clutches or friction drives to corrode during down time. The hydraulically operated spring-set brakes provide tripper positioning without creep, crawl, or accidental release.

Consult your nearest Continental office for complete information.

• *On any conveying or materials handling problem, consult your nearest Continental office.*

CGC

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Continental Gin Company

BIRMINGHAM, ALABAMA

ATLANTA • DALLAS • KNOXVILLE • MEMPHIS • MOBILE • NEW YORK 17

NEW PRODUCTS and equipment

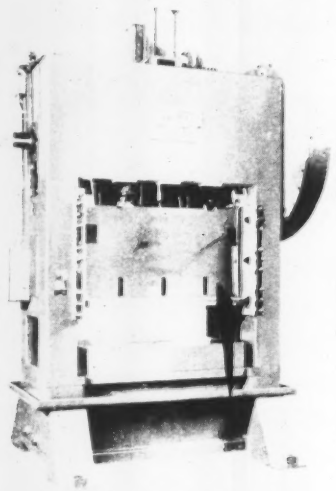
hopper feed at a high production rate. Typical uses include deburring or chamfering of both sides or ends of nuts, rods, shafts, or tubing.

Combination operations (drilling and countersinking, or drilling and counterboring) are adaptable. *Write*: Universal-Automatic Corp., 9545 Ainslie St., Schiller Park, Ill. *Phone*: Gladstone 5-7720

Large Press Speedy

Ruggedly built for high speed production without interruption, this 200-ton capacity, double eccentric press has four-piece tiered construction.

The unit has a speed of 50 to 150 strokes a minute, a bed area of 36



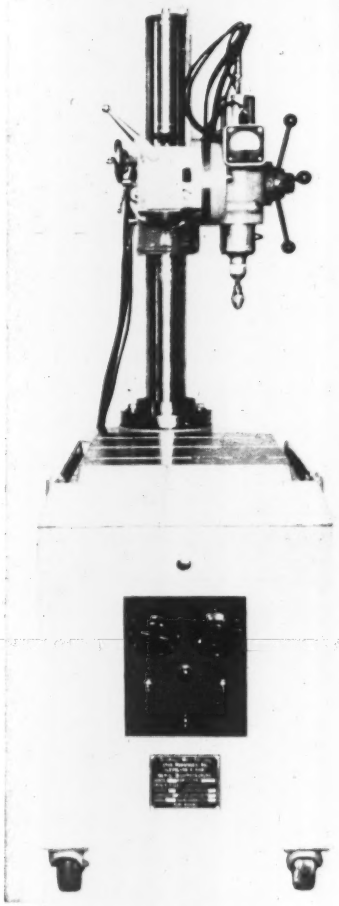
x 54 in., and a 4-in. stroke of slide with a 2-in. adjustment.

The press slide has power adjustment and is air-counterbalanced. *Write*: Cleveland Punch & Shear Works Co., 3917 St. Clair Ave., Cleveland 14, Ohio. *Phone*: Henderson 1-1911

Disintegrator Useful

The Model C-86 metal disintegrator does arc drilling of all shaped holes in hardened steels; titanium; stainless; Stellite; Hypernick; Tinamel; Hastelloy; honeycomb steel, aluminum, and titanium; and Inconel.

It removes broken taps, reamers,



hardened bearings, and case hardening on shafts. Workpieces are not damaged or threads distorted; Rockwell hardness is not affected. *Write*: Cammann Mfg. Co. Inc., 2700 Henninger Rd., Cleveland 9, Ohio. *Phone*: Ontario 1-2550

Compound Aids Machining

A new cutting compound possesses high film strength and the heat conductivity needed in high speed metalworking operations. It combines liquids with metallic solids.

A lasting but easily removed protective coating is formed over the machined surface by the compound, helping to eliminate the corrosion caused by perspiration and other oxidizing agents. *Write*: Commonwealth Engineering Co., Dayton, Ohio. *Phone*: Clearwater 3-1165

FASTENERS COST MONEY!

. . . BIG MONEY! Last year industry spent over $200,000,000 outright for fasteners. And many hidden factors in fastener selection affect production, assembly and maintenance costs! That's why design engineers recognize Chandler as leading manufacturers of dependable "AN", "NAS", "MS" and special bolts. Made from high carbon, alloy, super-alloy and stainless steels, cold-forged Chandler fasteners are precision engineered, produced to close tolerances and constantly inspected to assure maximum resistance to stress, shear, vibration. For quality fasteners mass-produced at a realistic price to meet your special requirements, specify Chandler fasteners by name. Write today for complete information.

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1488 Chardon Road
Cleveland 17, Ohio

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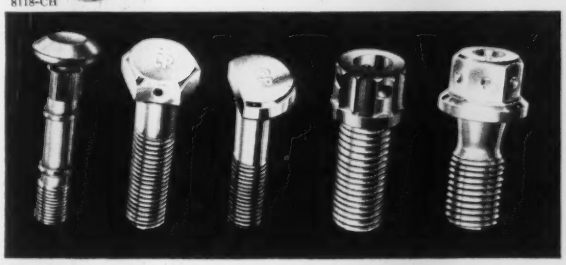

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NEW literature

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Lathe

A circular describes a 15-in. lathe that is designed to fill the gap between geared-head and belt-driven lathes. Sheldon Machine Co. Inc., 4258 N. Knox Ave., Chicago 41, Ill.

Heat for Plating

Electric Heat for Plating Baths (Bulletin GER-1333) discusses the advantages of electric heat and gives tips on proper selection, installation, power, and maintenance. General Electric Co., Schenectady 5, N. Y.

Barrel Finishing

The Vibraslide barrel finishing machine that incorporates vibration with its rotation is described in Bulletin 255. Metal Finish Inc., Frelinghuysen Avenue, Newark, N. J.

Instrumentation Systems

Measurements and Controls highlights instruments for shock, vibration, pressure, inertial control, temperature, and other devices for single components or complete systems. Gulton Instrumentation Div., Gulton Industries Inc., 212 Durham Ave., Metuchen, N. J.

Turret Drill

The ability to index instantly from one drill size to another or from one type of operation to another is a feature of the bench model Burgmaster turret drill. The machine is described in a folder. Burgmaster Corp., 13226 S. Figueroa St., Gardena, Calif.

Indexing Device

The 24-in. Super Spacer indexing device is described in a folder. Included is information on attachments, parts, and prices. Hartford Special Machinery Co., Homestead Avenue, Hartford, Conn.

Air-Gage Tracer

A brochure shows the precision work done by an Air-Gage Tracer. It is a versatile duplicating unit that makes a Monarch lathe convertible to a production machine for straight or contour turning, boring, or facing. Monarch Machine Tool Co., Sidney, Ohio.

Copper Tarnish Remover

An acid base liquid used to remove oxide and tarnish from copper, copper alloys, and silver is described in Technical Data Sheet No. 77. Metalex L-5 has long life and may be controlled by analytical procedure or a simple test kit. MacDermid Inc., Waterbury, Conn.

Conveyor Belt

Bulletin M302 describes the compensation and other features of the Ray-Man conveyor belt. No breaker fabric is required, says the maker: Manhattan Rubber Div., Raybestos-Manhattan Inc., Passaic, N. J.

Industrial Pump

Operation of the variable displacement internal-external pump is shown in a 4-page catalog. Advantages and suggested applications are given for industrial, commercial, and aircraft uses. Pesco Products Div., Borg-Warner Corp., Bedford, Ohio.

Research Reports

AEC Research Reports Price List No. 30 is a cumulative listing of more than 4000 Atomic Energy Commission reports in the Office of Technical Services collection. Documents acquired since January, 1958, are included. Office of Technical Services, Department of Commerce, Washington 25, D. C.

Rebuilt Screw Machines

Rebuilding of Brown & Sharpe automatic screw machines is described in an 8-page booklet by a company that has specialized in the rebuilding of this type of equipment for 25 years. Beaver Industries, 1500 W. Adams St., Chicago 7, Ill.

Analog Computer

An 18-page brochure and a folder describe the MC-5800 Master Precision Analog computer. This model has circuit logic required for building-block flexibility, bivariable function generation, and complete automatic problem check. Mid-Century Instrumatic Corp., 611 Broadway, New York 12, N. Y.

Vibrating Feeders

Standard and special model electromagnetic vibrating feeders for hard to handle bulk materials are covered in a 30-page catalog. Typical installations and a variety of application diagrams are included. Syntron Co., 370 Lexington Ave., Homer City, Pa.

Electronic Gage

The Series 620 electronic go-no go gage is described in a bulletin. It is for frequency stability and comparison checks; motor speed, pressure and flow, and material flow control, and other limiting situations occurring between 1 and 40,000 times a second. Computer Measurements Corp., 5528 Vineland Ave., North Hollywood, Calif.

Deaerating Heater

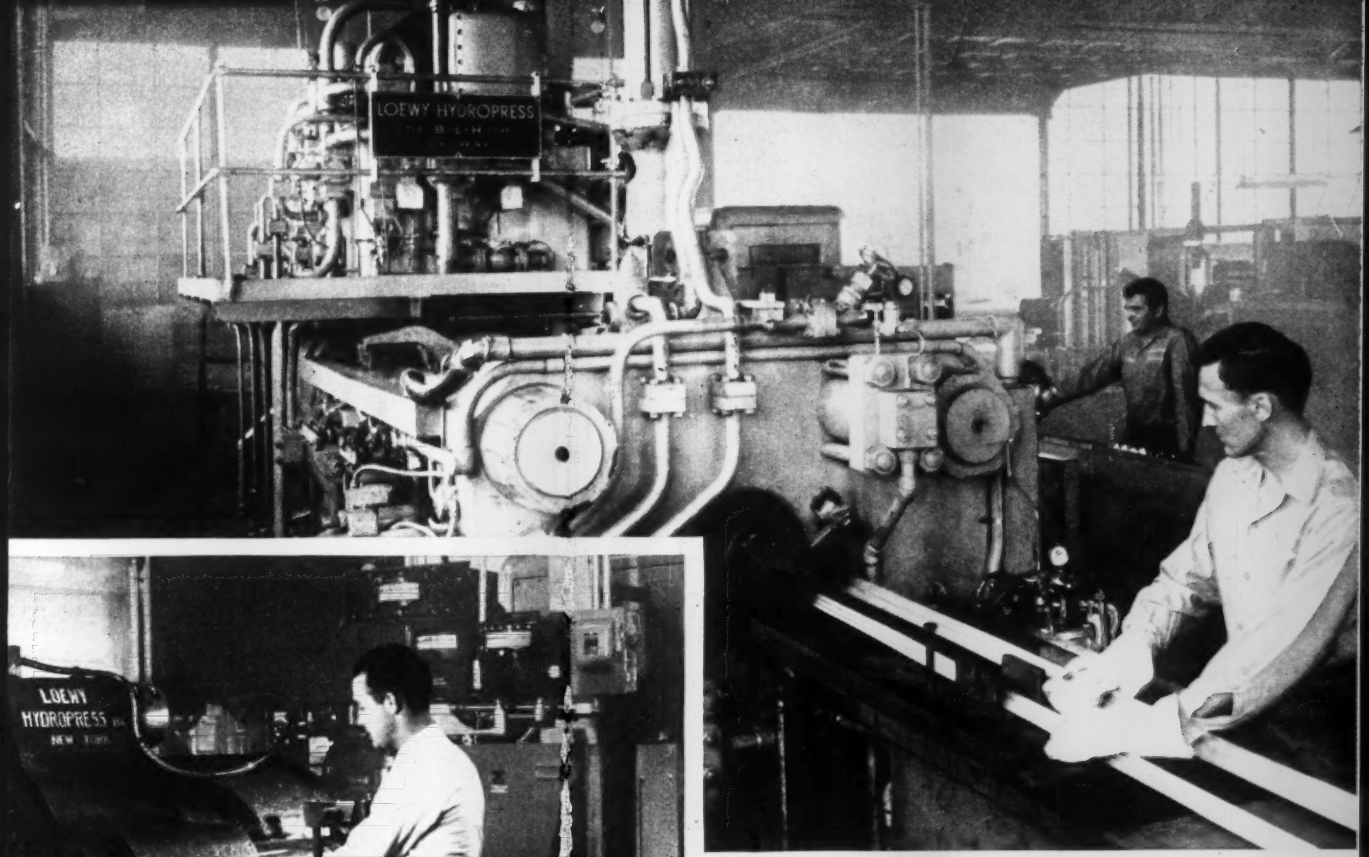
This bulletin gives information on a two-stage, spray-type packaged heater. The unit comes with a stainless steel internal vent condenser and in capacities from 2800 to 100,000 lb per hour. Graver Water Conditioning Co., 216 W. 14th St., New York 11, N. Y.

Belt Sander

A catalog sheet has been issued on a 6 x 60 in. hand-stroke belt sander. Base and a free rolling worktable are included with the machine. Boice-Crane Co., 1018 W. Central Ave., Toledo 6, Ohio.

Strapping Equipment

A 52-page catalog, *Handbook of Strapping and Materials Handling Equipment*, describes a comprehensive line of machines. Many helpful charts are included. A. J. Gerrard & Co., 1950 Hawthorne Ave., Melrose Park, Ill.



(above) At Alan-Scott Aluminum Corp., Division of Seasonmaster, Inc., Westbury, N.Y.

LOEWY 1250-TON-CAPACITY OIL-HYDRAULIC SELF-CONTAINED EXTRUSION PRESSES IN OPERATION

(left) At Arvin Industries, Inc., Columbus, Ind.

Loewy offers not only the finest extrusion presses, but also expert counsel on production planning

No longer is it enough for a pressbuilder to produce machinery which performs at high speed and with great precision and economy. His close contact with the individual business problems of many enterprises places him in the seat of a counselor, where his familiarity with the needs of industry and its problems of obsolescence, changes in trends and markets, new opportunities or local conditions, can be extremely valuable. Certainly in the ever-growing and complex field of extrusion his judgment can be of great value.

There is hardly any new development in our fast-moving technology which does not depend on the almost unlimited possibilities of extrusion. This is particularly true in the nuclear industry and the field of rockets and missiles. The application of extrusion widens every day. According to a recent report, school architects alone specified 75 aluminum extrusion applications. And a recent exhibit singled out 50 different fields in which extruded metals are being utilized.

Baldwin-Lima-Hamilton's Loewy-Hydropress Division, which pioneered extrusion in America, keeps a sharp eye on all developments in the markets for extrusion. And when you buy your extrusion equipment from us, we tackle not only problems relating to equipment design, but also those relating to production economy. This extra assistance goes with your order as an integral part of our service.

You may also be interested to learn that special attention will be given to your inquiries on the design, construction and implementation of complete plants ready to operate, including the selection of the site and production planning, or what are known as turn-key projects. For complete information on our facilities to serve you, write to Dept. B-12.

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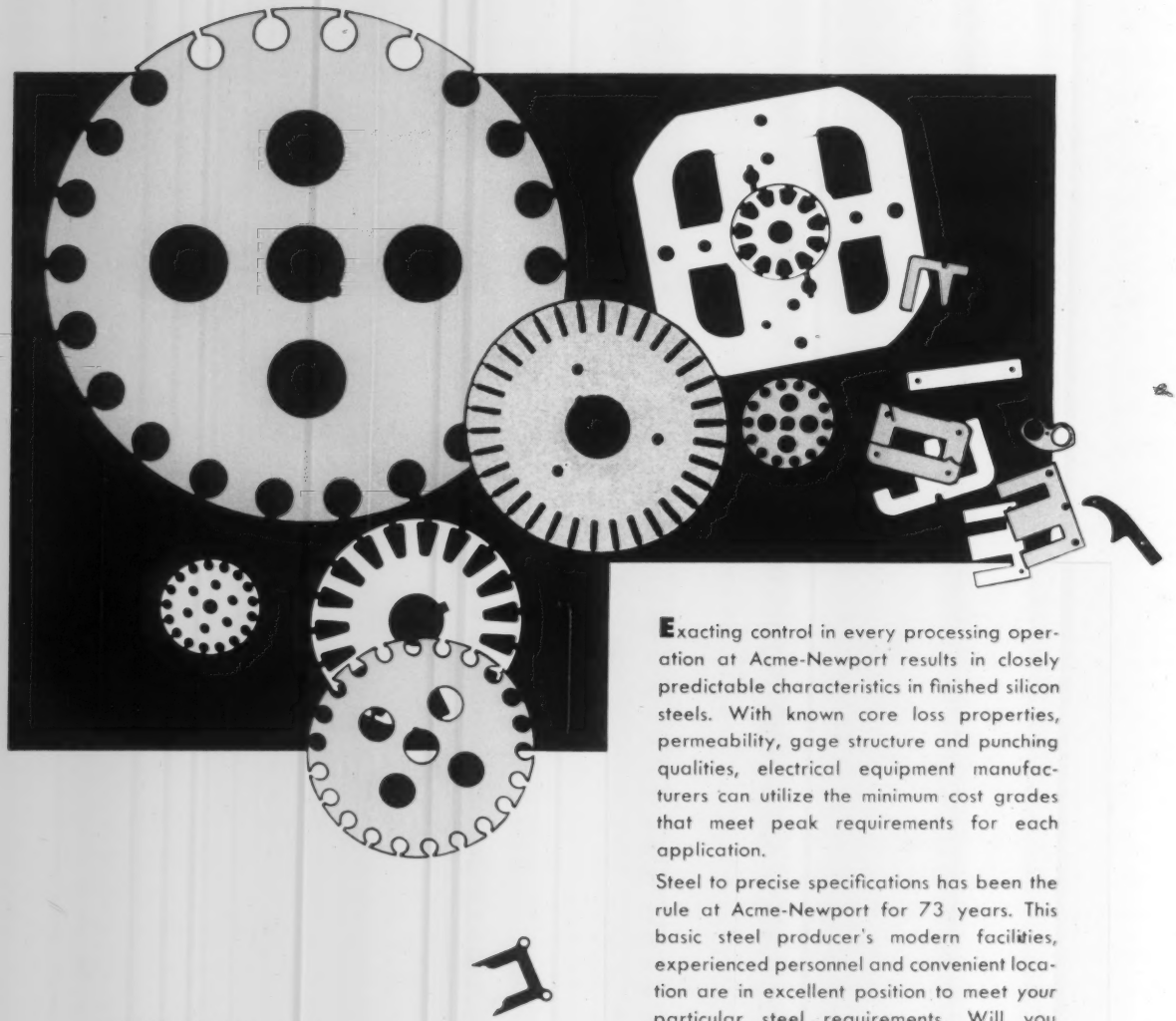

Exacting control in every processing operation at Acme-Newport results in closely predictable characteristics in finished silicon steels. With known core loss properties, permeability, gage structure and punching qualities, electrical equipment manufacturers can utilize the minimum cost grades that meet peak requirements for each application.

Steel to precise specifications has been the rule at Acme-Newport for 73 years. This basic steel producer's modern facilities, experienced personnel and convenient location are in excellent position to meet your particular steel requirements. Will you call us on your next order?

PRODUCTS OF ACME-NEWPORT STEEL

Hot Rolled Steel in Coil
Hot Rolled Pickled Steel in Coil
Hot Rolled Sheets
Hot Rolled Pickled Sheets
Cold Rolled Steel in Coil (*full hard only*)
Cold Rolled Sheets
Alloy Sheets and Plates
Plates ($\frac{3}{16}$" *and lighter*)
Electrical Sheets
Electric Weld Line Pipe

Acme-Newport Steel COMPANY

NEWPORT, KENTUCKY

A SUBSIDIARY OF ACME STEEL COMPANY

Steel Upturn Seen for Early '59

December 8, 1958

LOOK for a marked pickup in automotive steel buying after January. By that time, the automakers will know how well the new models are going over. If sales reports are bullish, they may decide to boost first quarter production by 100,000 cars (to 1.6 million) and second quarter output by as much as 300,000 (to 1.8 million). In that event, they'll need more steel for immediate consumption. They'll probably increase their flat-rolled inventories from the current level (about 23 days) to 30 days.

STRIKE THREAT WEIGHED—Automakers won't have to worry much about the availability of steel unless there's a strike. If they conclude that a walkout is inevitable (the USW's three-year contract expires on June 30), they'll have two alternatives: They can build an inventory of cars or an inventory of steel. If sales are good, they'll probably try to make a lot of cars before the deadline. If sales are disappointing, they can stock enough steel to see them through. They'll have to step up their buying in either case, but this much is certain: They'd rather have their money invested in cars that can be sold to dealers than in steel that must be stored before it's used.

AUTO SALES IMPROVE—During the middle third of November (nine selling days), auto dealers sold 146,000 new cars. Their daily average of 16,200 cars was 38 per cent higher than that of the first third of the month (11,740 cars). This gave automakers their first really good report on the 1959 models. Industry spokesmen don't regard initial sales figures as conclusive, so they're in no hurry to revise their prediction that 1959 will be a 5.5-million car year. But economists retained by one steel company are taking an optimistic view. They believe 1959 car assemblies may reach 6.8 million.

MORE FORWARD BUYING— Chicago steelmakers say their customers are placing orders farther ahead. One mill's backlog is the largest it has had in more than a year, and most of the tonnage is for advanced delivery. Users are aware of the tightness in cold-rolled and galvanized sheets and realize that demand for plates and shapes may increase early next year. They figure they have nothing to lose by protecting themselves.

MORE ALUMINIZED STEEL— Ford Motor Co.'s decision to use aluminum coated steel for auto mufflers has convinced most steelmakers that it's high time they offered Armco Steel Corp. some competition. U. S. Steel Corp. began production of cut lengths at its Gary, Ind., works recently, and Republic Steel Corp. is making coils at Warren, Ohio. Other mills are known to be interested. Says one: "We believe aluminized sheets will take 40 per cent of the market now served by galvanized as soon as the cost differential is cut to 10 per cent."

WIRE IMPORTS FEARED— "The St. Lawrence Seaway will be the avenue for more foreign steel products next year, at prices the American mills can't match. The seaway will heighten foreign competition in the Midwest," warns David C. Roscoe, Bethlehem Steel Co.'s assistant general manager of sales.

INGOT RATE CLIMBS— Last week, steelmaking operations rose half a point to 74.5 per cent of capacity. Production was about 2,011,000 net tons of steel for ingots and castings.

WHERE TO FIND MARKETS & PRICES

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*Current prices were published in the Dec. 1 issue and will appear in subsequent issues.

Metalworking Outlook—Page 55 Technical Outlook—Page 107

Tidewater Oil Company's 200 million dollar refinery near Wilmington, Delaware. Six of its eleven processing units are largest of their types ever built!

SQUARE D CONTROL CENTERS

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Here's Why Square D is Your Logical Choice, too!

INCREASED SAFETY! • Bus bars fully enclosed, rigidly supported and have ample cross section. Circuits isolated by individually enclosed plug-in units. Disconnect handle gives maximum operator protection.

FLEXIBILITY! • Individual plug-in units or complete sections easily added, removed or exchanged. Pushbuttons, pilot lights, and selector switches readily added to unit doors.

INSTALLATION ECONOMY! • All wiring channels are large and accessible from front without removing units. No "wire fishing."

SPACE ECONOMY, TOO! • Up to six combination starters fit in a 20" x 90" section. Plug-in unit heights designed in space-saving increments of 3".

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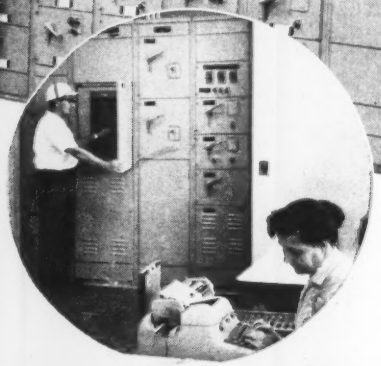

(Top photo) In the refining area **Square D Control Centers** provide a portion of the centralized control of pumps and compressors. In the maintenance shop they control power, heating, ventilating and lighting.

(Lower photo) Another Square D Control Center, located in the Employe Relations Building, provides pushbutton control of air-conditioning units and compressors. Infirmary X-Ray equipment and parking lot lighting also are remotely controlled from this Center.

EC&M HEAVY INDUSTRY ELECTRICAL EQUIPMENT...NOW A PART OF THE SQUARE D LINE

SQUARE D COMPANY

ACF Industries Inc.

Gray Iron Tonnage

*1959	12,000,000
*1958	10,500,000
1957	12,665,000
1956	13,861,000
1955	14,838,000
1954	11,532,000

*Estimated by Gray Iron Founders Society.

Gray Iron Summary

Fourth Quarter Production: 2,750,000 tons.

Prices: Going up (5 to 7 per cent).

Costs: Up 5 per cent since Jan. 1.

Backlogs: Three to four weeks.

Workload: 65 per cent of capacity.

Inquiries: Heavy.

Orders: Up (many small).

First Half Outlook: Good.

Gray Iron Business Upturn Begins

GRAY IRON casting shipments are on the rise this quarter, and with them, the industry's hopes.

Inquiries are heavy, orders are improving (though most are small), and backlogs are slowly climbing.

"Even our most pessimistic member," says Donald Workman, executive vice president of the Gray Iron Founders Society, "who only three or four weeks ago saw little hope, is now cautiously optimistic."

• **Business Still Not Good**—That does not mean fourth quarter business is good. It's still bad by any measure other than 1958. But the trend is up. Seventy per cent of the respondents to STEEL's gray iron survey expect shipments to improve an average of 16 per cent this quarter, and most feel that 1959 shipments will be better than 1958's by about 18 per cent.

• **But Will Get Better**—"Total gray iron production this year is expected to hit 10.5 million tons, almost 200,000 tons of which will be nodular iron," says Mr. Workman. "Next year's total should be about 12 million tons," he adds.

Hurt the least this year have been the foundries supplying the construction or construction equipment fields.

Foundries whose markets are diversified have also fared relatively well. The only foundry in STEEL's survey to report 1958 business better than 1957's (10 to 15 per cent) keeps close tabs on its customer distribution. It allows no one area of industry to account for more than a certain percentage of its business, thereby protecting itself from industry slumps.

• **Costs Up**—Labor and material costs have risen an average of 5 per cent since Jan. 1. (This figure is low as the result of cost cutting programs in the industry.) Foundries have had to absorb this increase and in some cases, pare prices, to remain competitive.

• **Prices To Go Up Soon**—During first half 1959, foundries will advance prices 5 to 7 per cent if the general business uptrend continues. "And if things really move up, another boost of at least 3 per cent

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may be expected during the second half," says one producer.

• **Backlogs Crawl Up**—Backlogs average three to four weeks. Most respondents say that is a slight increase over the Jan. 1 level. The average workweek is 39 hours. Operations are averaging 65 per cent of capacity.

• **Shell Molding Gains**—Few foundries are using CO_2 molding to any extent, but shell molding and coremaking have gained considerably this year. One foundry calls shell cores "the outstanding advance in gray iron casting."

David Clark, plant manager of Forest City Foundries Co., Cleveland, says: "We have gone into shell molding this year as a service to customers, and will expand our shell facilities next year. The better finish and closer tolerances possible with the process have allowed some of our customers to cut costs. Fewer machine operations justifies the added cost of shell castings, but not in all applications. It is no panacea. There must be a saving to the customer, or he isn't interested."

• **Mortality Rate High**—"Well over 100 foundries called it quits this year, compared with 70 to 80 last year," says Mr. Workman. "But," he notes, "at least 50 per cent of these were captives. Managers, hunting ways to cut costs, found they could buy castings cheaper than they could make them, and so closed down their foundries. That has channeled business into the jobbing foundries."

The recession may ultimately prove a plus to the industry, for foundries have been forced to sharpen their operations to stay alive. More engineering services, higher quality castings, and closer cost control has been the result.

Those efforts are not going unrewarded. One foundry manager says: "We would have had to raise prices at least 12 per cent to get our profit picture back in line, but now, after trimming the fat from our organization, we'll be in good shape if we get a 5 to 7 per cent price increase."

• **Management Changing**—"In general," observes Mr. Workman,

there's so much to choose from at...

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For rapid service in the most unique bar in the country . . . decorated with an outstanding collection of miniature trains

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Pause — in the relaxing, informal atmosphere of the gayly decorated Patio. It's a Cleveland habit to say — "Meet me at the Patio."

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Service is brisk and decor cheerful in the modern, air-conditioned coffee shop. Enjoy a tasty sandwich or a moderately priced meal

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CLEVELAND, OHIO

"foundry managers are getting away from the production end of the shop where they have been for so many years. This is good. To progress, foundry executives must be marketing minded.

"The potential uses and markets for iron are unlimited, but it will take marketing to exploit it."

Pig Iron . . .

Pig Iron Prices, Page 160

Merchant pig iron sellers expect December to be one of their dullest months. Buying for stock has been light in recent months because supplies have been plentiful and shipments prompt.

Hand-to-mouth buying is expected to continue into the new year.

Wire . . .

Wire Prices, Pages 157 & 158

Not much change in wire demand is anticipated over the rest of the year. Manufacturers wire is available for delivery within ten days to two weeks, and merchant items can be had from stock. Imported wire continues a thorn in the side of domestic sellers, who find it impossible to meet the price competition offered.

Tool Steel . . .

Tool Steel Prices, Page 159

Shipments of high speed and tool steel (excluding hollow drill steel) in October totaled 7217 net tons, reports the American Iron & Steel Institute. That's up noticeably from the 5990 tons shipped in September, and is down only 218 tons from the 7435 tons moved in October, 1957.

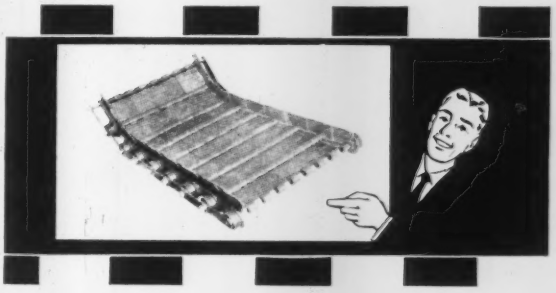
In the first ten months of this year the total movement was 56,834 tons, compared with 84,946 in the like period last year.

A major change in the pricing system of V-R carbide blanks, inserts, brazed tools, and toolholders is announced by Vascoloy-Ramet Corp., Waukegan, Ill. Some items are higher; some are lower; some are unchanged.

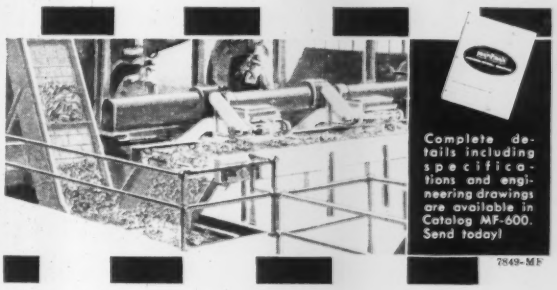
Base prices and quantity breaks have been established for both stock and nonstock items. But all quantity prices are prefigured on stock items for easy reference.

In addition to the change in pric-

May-Fran Hinged-Steel Belting is assembled from mass-produced components to form a materials handling belting of almost any width,



length or contour to meet individual specifications. Links are joined by means of steel rods . . . links, wings and side chain become integral unit.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MAY-FRAN ENGINEERING, INC.
1725 Clarkstone Road, Cleveland 12, Ohio

ing policy, the company also announced several new style toolholders.

Plates . . .

Plate Prices, Page 155

Trading in plates is slower, marking continuation of the downtrend that's been apparent in recent weeks. The slowing down in tankwork, heavy building construction, and industrial equipment has been particularly noticeable. Shipwork is providing the main prop to demand in the East.

Platemakers anticipate some gain in business after the turn of the year, banking their hopes on a probable expansion in building requirements, and a further stepping up in ship needs.

Quick deliveries are available on sheared, universal, and strip plates.

Tin Plate . . .

Tin Plate Prices, Page 157

Shipments of tin plate fell sharply last month. Consumers had stocked up during October to beat the Nov. 1 price increase. The outlook for December buying is improved. The can companies are now buying for January production.

Alloy Steel . . .

Production of alloy steel (other than stainless and heat resisting) in October totaled 640,242 net tons, bringing the ten-month total for the year to 4,489,562 tons, reports the American Iron & Steel Institute. Output in the preceding month was 515,818 tons. In October, 1957, it was 752,680 (including stainless). The ten-month total last year, including stainless, was 7,657,191 tons.

Stainless and heat-resisting steel output in October this year was 120,320 tons, up 42 per cent from the September level, and bringing the ten-month total to 712,739 tons. Comparable figures for 1957 are not available.

Sheets, Strip . . .

Sheet & Strip Prices, Pages 156 & 157

Some smaller sheet mills are running near capacity on cold rolled, promising deliveries in six to seven weeks. But larger makers are still taking December delivery orders.

In some cases, cold rolled shipments in November were as large as October's, and now a December drop is anticipated due to the holidays and delivery deferments.

There's still considerable "rush" business; some mills are losing orders for certain grades to competitors offering faster service. The situation is particularly true in cold-rolled and galvanized sheets.

One midwestern mill's order backlog is the heaviest in a year. Much of it is made up of forward delivery tonnage, indicating more consumers are protecting themselves into early 1958. Not much current buying is due to hedging against a price increase, or a mid-1959 steel strike, but hedge buying is expected to begin toward end of first quarter.

Hot-rolled sheets are available in three to four weeks, and cold rolled in five to six. Hot dip galvanized sheets can be had within eight weeks, and promises on some coated specialties are more extended.

Silicon sheets and strip are in stronger demand. One producer of strip says its volume is the best in a year. It's getting larger orders from appliance makers and manufacturers of power equipment.

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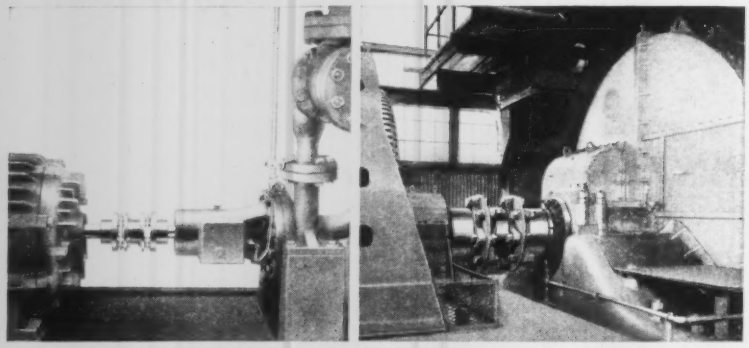

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THOMAS FLEXIBLE COUPLING COMPANY

WARREN, PENNSYLVANIA, U.S.A.

Steel Bars . . .

Bar Prices, Page 155

Diversified demand is contributing to a fairly lively market for hot-rolled carbon bars. But the trend is still downward, and sellers anticipate little improvement in ordering until early next quarter.

There's been a slight pickup in orders from auto builders and appliance makers, and some sellers think shipments this month will better those in November by 15 per cent.

Deliveries range two to four weeks on hot carbon bars and around three weeks on hot alloy bars where special treatment is specified. Cold-drawn alloy bar shipments are somewhat more extended.

Tubular Goods . . .

Tubular Goods Prices, Page 159

Aided by automotive demand, mechanical tubing continues to make the best sales showing of the tubular products. Demand for seamless and buttweld standard pipe is down seasonally with construction.

Line pipe orders are still dammed up by the Supreme Court's review of the Memphis gas rate case. Even if the court issues a favorable decision, steelmen don't expect any sudden influx of business.

Demand for oil country goods is improving slowly. November shipments equaled those in October, and one Pittsburgh mill looks for a 10 per cent pickup this month. Most of the business is coming from the smaller consumers.

Semifinished Steel . . .

Semifinished Prices, Page 155

During the week ended Nov. 29, Inland Steel reported all-time highs in employment and production at its Indiana Harbor Works, East Chicago, Ind. Employment reached 19,400, topping the previous record, 19,231 set in August, 1957.

Ingot output totaled 118,000 net tons, with operations averaging 94 per cent of capacity. The previous record was set in the week ended Mar. 24, 1957, when 116,477 tons were produced at an operating rate of 111 per cent.

Inland's ingot producing capacity will be officially rated at 6.5 mil-

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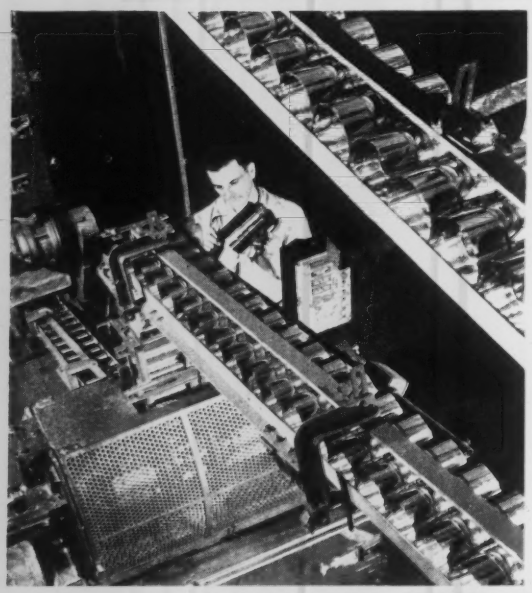


IBM improves its paint finishing using sprayed textured vinyl

Unichrome Coating 6400, a new, spray applied, textured vinyl finish, has greatly improved the quality of machine covers for IBM's Data Processing equipment. It provides much longer life in service due to its increased scratch and mar resistance. Rejects from in-transit damage and material handling have been sharply reduced. Savings, particularly in refinishing, have been accomplished by these improved physical properties.

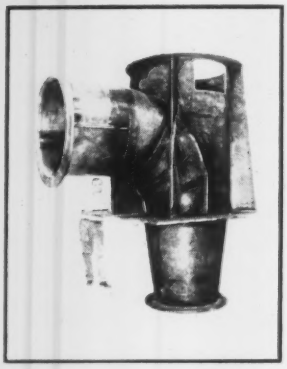
Available in a variety of colors, Unichrome Coating 6400 delivers a handsome leather-like finish with less complications and cost than obtained by use of laminated vinyl.

Films range from 8 to 20 mils in thickness and will outwear ordinary textured enamels by 10 to 1. Send for bulletin.

Tin cuts costs and contamination

Steel manufacturers each year produce enough "tin strip"—sheet steel continuously plated with a thin coating of tin—to provide 40 billion cans. The food industry alone spends some $45 million for the familiar containers. Why *tin?* It's one of the few practical metals that's non-toxic and a corrosion preventive. Most of the tin plate produced in this country is plated at high speed and low cost with stannous chloride, a unique plating chemical developed by Metal & Thermit, first name in tin and tin chemicals.

Photo courtesy of American Can Company



Welded pump elbow handles 2,000,000 gals. an hour

For such high capacity and big as it is, this pump section has to be dependably strong. That's why Murex electrodes were used exclusively in welding the half-inch thick plates. These electrodes produce uniform welds free of porosity—even over any possible gaps in the fit-up—with more than enough strength for the tremendous hydraulic forces the pump will develop. Built by Viking Metal Fabricators, Inc., this elbow section stands 10 feet high, has a 42-inch O.D. Bulletin ESC describes M&T welding line.

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lion net tons on Jan. 1, 1959. That's a boost of 700,000 since Jan. 1, 1958. Ten years ago, the rating was 3.4 million.

Distributors . . .

Prices, Page 160

Bookings by steel service centers are beginning to taper, reflecting seasonal factors. The sales curve for the industry is well below that for the steel producers.

Most forecasts by distributors are for an improvement in business in the first quarter of next year, followed by a substantial gain in the second quarter. The outlook is based on low inventory levels of consumers and prospects for a higher rate of consumption. The threat of a steel strike is also expected to stimulate purchasing in first half.

Rails, Cars . . .

Track Material Prices, Page 158

For the first time since early July, U. S. Steel's Tennessee Coal & Iron Div., is producing steel rails at its Ensley mill in Birmingham. Operations were resumed Dec. 1.

Railroad equipment manufacturers are calling for a little more steel than they have been taking recently, but orders are still far from pressing.

Structural Shapes . . .

Structural Shape Prices, Page 155

October bookings of fabricated structural steel, totaling 259,016 tons, marked the fifth straight month new orders topped those in the corresponding month a year ago, reports the American Institute of Steel Construction Inc. The total was also 1 per cent above the September tonnage, and was 43 per cent greater than that in October, 1957.

Bookings in the first ten months of this year amounted to 2,334,299 tons, 14 per cent less than in the corresponding period last year.

Shipments during October were 307,080 tons, 20 per cent less than the 385,000 tons shipped in October, 1957. In the first ten months of this year, the industry shipped 3,126,559 tons, vs. 3,525,415 in the like 1957 period.

Reported backlog as of Oct. 31 was 1,912,665 tons. Of that total, 1,083,212 tons are scheduled for fabrication during the four months ending Feb. 28, 1959.

Public works feature structural activity. Numerous bridge jobs are before the market, and more are in prospect. In general, though, demand is leveling off seasonally, and not much change is anticipated before spring.

Fabricators are shipping more tonnage than they're booking, and their backlogs are declining. But most shops have enough business in hand to sustain fabricating operations for the next several months. By then, a pickup in ordering should be underway.

Considerable work is reported on drawing boards, and some jobs will begin coming out for bids early next quarter. Fabricators in the Pacific Northwest report they are booking a fair volume of small jobs.

The Houston representative of a French steelmaker last week announced a 5-cent price increase on structural shapes and bars. His forecast: Higher prices generally on imported steel soon after the turn of the year.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

1000 tons, downtown interchange (state), Pittsburgh, to Pittsburgh Bridge & Iron Works, Pittsburgh.

910 tons, six grade separations, Enfield, Conn., to City Iron Works, Wethersfield, Conn.; E. T. O'Neill & Son Construction Corp., Holyoke, Mass., general contractor; also, 350 tons of steel piles, to Bethlehem Steel Co., Bethlehem, Pa.

690 tons, state bridge, Thompson Falls, Mont., to unstated interest; Peter Kiewit Sons Co., general contractor.

520 tons, three grade separations, Danbury, Conn., to City Iron Works, Wethersfield, Conn.; W. J. Megin Inc., Naugatuck, Conn., general contractor.

500 tons, school, general state authority, Cambria County, Pennsylvania, through Boyd H. Kline, general contractor, to Moore Metals Co.

475 tons, state highway bridge over railroad, West Hartford, Conn., to American Bridge Div., U. S. Steel Corp., Pittsburgh, and Bethlehem Steel Co., Bethlehem, Pa.; Charter Oak Construction Co. Inc., Hartford, Conn., general contractor.

379 tons, state interchange, Farhurst, Del., through Burger Contracting Co. to Mayer Pollock, Pottstown, Pa.

365 tons, state highway bridge, Waterville-Oakland, Maine, to Bancroft & Martin Rolling Mills Co., South Portland, Maine; Seaboard Engineering Co., Portland, Maine, general contractor.

345 tons, Du Pont Co. plant, Orange, Tex., to Austin Bros.

325 tons, bracing for cofferdam, Norwalk, Conn., to Frank M. Weaver & Co., Philadelphia.

315 tons, state highway bridge, interstate route over the Maine Central Railroad and County Rd., Waterville, Maine, to Bethlehem Steel Co., Bethlehem, Pa.; Cal-

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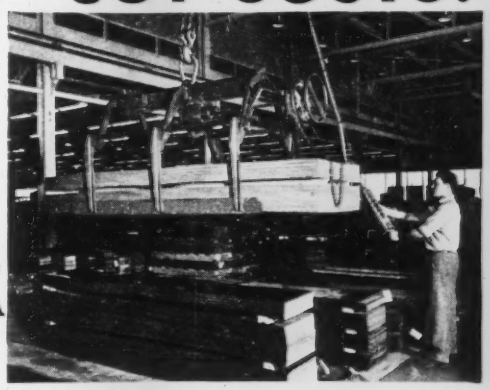

The A. B. Dick Company, Niles, Illinois, found that this C-F Lifter has substantially reduced man hours and crane time required to move stock in and out of storage.

Up to 10,000 lbs. of high grade sheets in varying widths may be picked up, carried and unloaded at shears or machines with speed and economy by the Lifter and its operator.

C-F Lifters are made in standard or semi-special models to handle from 2 to 60 tons. Bulletin SL-30 describes the advantages you can obtain from C-F Lifters. Write for it today.

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Isham Bros. Inc., Mechanics Falls, Maine, general contractor.

STRUCTURAL STEEL PENDING

8000 tons (6500 for the main span and 1500 for approach work), bridge across the Mississippi River at Helena, Ark., for the Mississippi-Arkansas Joint Bridge Authority, J. F. Beasley, Dallas, Tex., low on erection.

1957 tons, state bridgework, Cumberland County, Pennsylvania; bids Dec. 19.

1565 tons, Armstrong County, Pennsylvania; bids Dec. 19; alternates not specified.

1100 tons, state bridge, Bloomsburg Township, Hunterdon County, New Jersey, bids Dec. 16.

1000 tons, reconstruction work on Madison Ave. Bridge over the Harlem River, for the Department of Public Works, New York; bids closed Dec. 5.

200 tons, municipal bridge, Seneca Falls, N. Y., Speranzo & Barile, Rochester, N. Y., low on the general contract.

REINFORCING BARS . . .

REINFORCING BARS PLACED

600 tons, six grade separations and highway pavement, Enfield, Conn., to U. S. Steel Supply Div., U. S. Steel Corp., Pittsburgh; E. T. O'Neill & Son Construction Corp., Holyoke, Mass.; also, 615 tons of highway mesh, to Bethlehem Steel Co., Bethlehem, Pa.

435 tons, three grade separations, Danbury, Conn., to U. S. Steel Supply Div., U. S. Steel Corp., Pittsburgh; W. J. Megin Inc., Torrington, Conn., general contractor.

330 tons, state highway bridge over railroad, West Hartford, Conn., to Joseph T. Ryerson & Son Inc., Boston; Charter Oak Construction Co. Inc., Hartford, Conn., general contractor.

PLATES . . .

PLATES PLACED

4000 tons, 13 penstocks, 28 ft in diameter, Lewiston, N. Y., powerplant, to Chicago Bridge & Iron Co., Greenville, Pa., through the New York State Power Authority, Niagara Falls, N. Y., power project.

300 tons, including shapes, 329-ft auto ferry, to Victoria Machinery Depot Co. Ltd., Victoria, B. C., low at $2,377,317.

PIPE . . .

CAST IRON PIPE PENDING

69 tons, 4 and 6 in., for Kent and Elma, Wash.; bids in.

300 tons, structurals and bars, two state highway bridges, Manchester, N. H., to Groisser & Shlager Iron Works, Somerville, Mass. (structurals), and Joseph T. Ryerson & Son Inc., Boston (reinforcing bars); Coleman Bros., Readville, Mass., general contractor.

275 tons, post office and courthouse, Jamestown, N. Y., through Noonan Inc., York, Pa., to Electroweld Corp.

RAILS, CARS . . .

RAILROAD CARS PLACED

Bureau of Mines, 20 tank cars for helium transportation, to American Car & Foundry Div., ACF Industries Inc., New York, costing $1,959,000.

Ore Stocks Up in October

Stocks of iron ore (from all sources) in the U. S. and Canada at the end of October totaled 75,171,039 gross tons, reports the American Iron Ore Association and the American Iron & Steel Institute. At the end of October, 1957, the total was 72,063,801 tons. (For details, see accompanying table).

Consumption of iron ore in the U. S. and Canada in October amounted to 9,519,832 tons, vs. 8,214,164 in September and 10,729,129 in October, 1957. (Details are given in the accompanying table).

At the end of October, 197 blast furnaces (out of 276) were operating in the U. S. and Canada, vs. 220 on the same date a year ago.

Iron Ore Statistics—October, 1958

(Gross tons)

STOCKS AT FURNACE YARDS AND DOCKS ON LAST DAY OF MONTH

Stocks at	U. S. Ores		Canadian		Foreign	
U. S. Furnaces:	L. Superior	Other	L. Superior	Other	Ores	Totals
Eastern	5,729,725	184,102	228,346	1,927,797	3,933,195	12,003,165
Pitts.-Valley	13,461,004	55,066	719,966	2,909,126	4,256,909	21,402,071
Cleve.-Detroit	10,601,966	95,782	423,639	396,420	368,488	11,886,295
Chicago	15,190,861	(a)	(a)	.....	(a)	15,190,861
Southern	(a)	2,482,079	.....	(a)	1,943,725	4,425,804
Western	.....	934,337	.....	.....	.....	934,337
Total	44,983,556	3,751,366	1,371,951	5,233,343	10,502,317	65,842,533
At U. S. Docks:						
Lake Erie	4,577,484	.....	91,193	1,187,079	.....	5,855,756
Other	.....	.....	.....	(a)	(a)	(a)
Total	4,577,484	.....	91,193	1,187,079	(a)	5,855,756
Total U. S.	49,561,040	3,751,366	1,463,144	6,420,422	10,502,317	71,698,289
Canadian	2,616,914	.....	144,849	613,234	97,753	3,472,750
Total U. S.-Canada	52,177,954	3,751,366	1,607,993	7,033,656	10,600,070	75,171,039

CONSUMPTION OF IRON ORE—OCTOBER, 1958

(Gross tons)

In U. S.:	U. S. Ores		Canadian		Foreign	
	L. Superior	Other	L. Superior	Other	Ores	Totals
Eastern	538,593	173,279	51,321	275,110	809,659	1,847,962
Pitts.-Valley	1,669,960	125,524	97,591	370,197	448,724	2,711,996
Cleve.-Detroit	1,118,602	35,570	71,130	37,942	99,780	1,363,024
Chicago	2,029,573	(a)	(a)	.....	(a)	2,029,573
Southern	(a)	404,745	.....	(a)	247,801	652,546
Western	.....	522,727	.....	.....	.....	522,727
In U. S.:						
Blast furnaces	4,212,519	899,912	160,744	407,370	634,695	6,315,240
Steel furnaces	171,923	70,467	16,859	13,020	454,600	726,869
Sintering (1)	972,281	289,635	42,409	262,859	513,953	2,081,137
Miscellaneous (2)	5	1,831	.....	.....	2,716	4,552
Total U. S.	5,356,728	1,261,845	220,012	683,249	1,605,964	9,127,828
In Canada:						
Blast furnaces	158,279	.....	87,332	69,606	.....	315,217
Steel furnaces	305	.....	.....	2,695	15,674	18,674
Sintering (1)	9,754	.....	25,882	21,801	676	58,113
Miscellaneous (2)	.....	.....	.....	.....	.....	.....
Total Canada	168,338	.....	113,214	94,102	16,350	392,004
Total U. S.-Canada	5,525,066	1,261,845	333,256	777,351	1,622,314	9,519,832

1—Iron ore and iron ore concentrates consumed in sintering plants not at mine sites.
2—Sold to nonreporting companies, or used for purposes not listed.
Data from American Iron Ore Association and American Iron & Steel Institute.

DISTRICT INGOT RATES

(Percentage of Capacity Engaged)

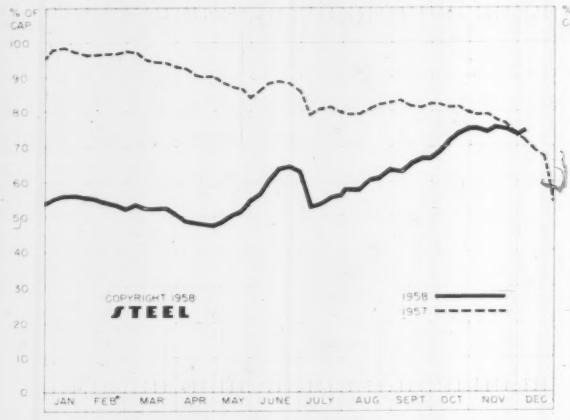
	Week Ended Dec. 7	Change	Same Week 1957	Same Week 1956
Pittsburgh	70	+ 3.5	75	98
Chicago	85.5	+ 0.5*	75	98.5
Eastern	71	0	82	101
Youngstown	60	+ 1	71	104
Wheeling	78	— 5	60.5	102
Cleveland	73.5	+ 2*	70.5	107.5
Buffalo	66	— 2.5	63.5	107.5
Birmingham	62.5	+ 2	61.5	94
Cincinnati	81.5	— 3.5*	73	92.5
St. Louis	89	— 3.5	75.5	104.5
Detroit	100	+ 1.5*	89.5	99.5
Western	80	+ 1	84	103
National Rate	74.5	+ 0.5	71.5	100.5

INGOT PRODUCTION‡

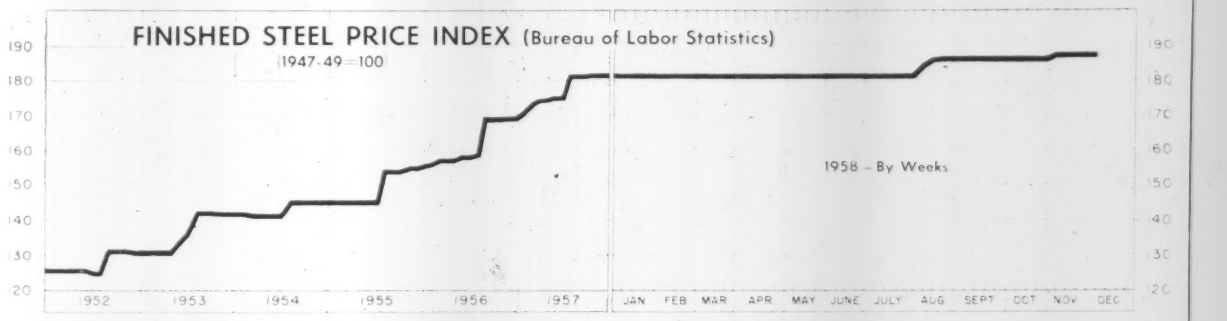
	Week Ended Dec. 7	Week Ago	Month Ago	Year Ago
INDEX (1947-49=100)	125.3†	123.8	125.2	114.0
NET TONS (In thousands)	2,013†	1,988	2,011	1,831

*Change from preceding week's revised rate. †Estimated. ‡American Iron & Steel Institute. Weekly capacity (net tons): 2,699,173 in 1958; 2,559,490 in 1957; 2,461,893 in 1956.

NATIONAL STEELWORKS OPERATIONS



Price Indexes and Composites



Dec. 2, 1958	Week Ago	Month Ago	Nov. Avg	Year Ago
187.4	187.4	186.7	187.4	181.7

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended Dec. 2

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them, write to STEEL.

Rails, Standard No. 1	$5.825	Bars, Reinforcing	6.385
Rails, Light, 40 lb	7.292	Bars, C.F., Carbon	10.710
Tie Plates	6.875	Bars, C.F., Alloy	14.125
Axles, Railway	10.175	Bars, C.F., Stainless, 302 (lb)	0.553
Wheels, Freight Car, 33 in. (per wheel)	62.000	Sheets, H.R., Carbon	6.350
Plates, Carbon	6.350	Sheets, C.R., Carbon	7.300
Structural Shapes	6.167	Sheets, Galvanized	8.689
Bars, Tool Steel, Carbon (lb)	0.560	Sheets, C.R., Stainless, 302 (lb)	0.688
Bars, Tool Steel, Alloy, Oil Hardening Die (lb)	0.680	Sheets, Electrical	12.625
Bars, Tool Steel, H.R., Alloy, High Speed, W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.060 (lb)	1.400	Strip, C.R., Carbon	9.489
Bars, Tool Steel, H.R., Alloy, High Speed, W18, Cr 4, V 1 (lb)	1.895	Strip, C.R., Stainless, 430 (lb)	0.493
Bars, H.R., Alloy	10.775	Strip, H.R., Carbon	6.250
Bars, H.R., Stainless, 303 (lb)	0.525	Pipe, Black, Buttweld (100 ft)	20.525
Bars, H.R., Carbon	6.675	Pipe, Galv., Buttweld (100 ft)	24.315
		Pipe, Line (100 ft)	205.710
		Casing, Oil Well, Carbon (100 ft)	201.080
		Casing, Oil Well, Alloy (100 ft)	315.213
		Tubes, Boiler (100 ft)	51.200
		Tubing, Mechanical, Carbon (100 ft)	26.157
		Tubing, Mechanical, Stainless, 304 (100 ft)	205.608
		Tin Plate, Hot-dipped, 1.25 lb (95 lb base box)	10.100
		Tin Plate, Electrolytic, 0.25 lb (95 lb base box)	8.800
		Black Plate, Canmaking Quality (95 lb base box)	7.900
		Wire, Drawn, Carbon	10.575
		Wire, Drawn, Stainless, 430 (lb)	0.653
		Bale Ties (bundles)	7.967
		Nails, Wire, 8d Common	9.828
		Wire, Barbed (80-rod spool)	8.719
		Woven Wire Fence (20-rod roll)	21.737

STEEL's FINISHED STEEL PRICE INDEX*

	Dec. 3 1958	Week Ago	Month Ago	Year Ago	5 Yr Ago
Index (1935-39 avg=100)	247.82	247.82	247.82	239.15	189.74
Index in cents per lb	6.713	6.713	6.713	6.479	5.140

STEEL's ARITHMETICAL PRICE COMPOSITES*

Finished Steel, NT	$149.96	$149.96	$149.96	$146.03	$114.95
No. 2 Fdry Pig Iron, GT	66.49	66.49	66.49	66.49	56.54
Basic Pig Iron, GT	65.99	65.99	65.99	65.99	56.04
Malleable Pig Iron, GT	67.27	67.27	67.27	67.27	57.27
Steelmaking Scrap, GT	39.67	40.33	42.33	32.33	34.33

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL

	Dec. 3 1958	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bars, H.R., Pittsburgh	5.675	5.675	5.675	5.425	4.15
Bars, H.R., Chicago	5.675	5.675	5.675	5.425	4.15
Bars, H.R., deld. Philadelphia	5.975	5.975	5.975	5.725	5.302
Bars, C.F., Pittsburgh	7.65*	7.65*	7.65*	7.30*	5.20
Shapes, Std., Pittsburgh	5.50	5.50	5.50	5.275	4.10
Shapes, Std., Chicago	5.50	5.50	5.50	5.275	4.10
Shapes, deld., Philadelphia	5.77	5.77	5.77	5.545	4.38
Plates, Pittsburgh	5.30	5.30	5.30	5.10	4.10
Plates, Chicago	5.30	5.30	5.30	5.10	4.10
Plates, Coatesville, Pa.	5.30	5.30	5.30	5.10	4.35
Plates, Sparrows Point, Md.	5.30	5.30	5.30	5.10	4.10
Plates, Claymont, Del.	5.30	5.30	5.30	5.70	4.55
Sheets, H.R., Pittsburgh	5.10	5.10	5.10	4.925	3.925
Sheets, H.R., Chicago	5.10	5.10	5.10	4.925	3.925
Sheets, C.R., Pittsburgh	6.275	6.275	6.275	6.05	4.775
Sheets, C.R., Chicago	6.275	6.275	6.275	6.05	4.775
Sheets, C.R., Detroit	6.275	6.275	6.275	6.05-6.15	4.975
Sheets, Galv., Pittsburgh	6.875	6.875	6.875	6.60	5.275
Strip, H.R., Pittsburgh	5.10	5.10	5.10	4.925	4.425
Strip, H.R., Chicago	5.10	5.10	5.10	4.925	3.925
Strip, C.R., Pittsburgh	7.425	7.425	7.425	7.15	5.45
Strip, C.R., Chicago	7.425	7.425	7.425	7.15	5.70
Strip, C.R., Detroit	7.425	7.425	7.425	7.25	5.45-6.05
Wire, Basic, Pittsburgh	8.00	8.00	8.00	7.65	5.525
Nails, Wire, Pittsburgh	8.95	8.95	8.95	8.95	6.55
Tin plate (1.50 lb) box, Pitts.	$10.65	$10.65	$10.65	$10.30	$8.95

*Including 0.35c for special quality.

SEMIFINISHED STEEL

Billets, forging, Pitts. (NT)	$99.50	$99.50	$99.50	$96.00	$75.50
Wire rods 5/32-5/8" Pitts.	6.40	6.40	6.40	6.15	4.525

PIG IRON, Gross Ton

	Dec. 3 1958	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bessemer, Pitts.	$67.00	$67.00	$67.00	$67.00	$57.00
Basic, Valley	66.00	66.00	66.00	66.00	56.00
Basic, deld., Phila.	70.41	70.41	70.41	70.01	60.75
No. 2 Fdry, NevilleIsland, Pa.	66.50	66.50	66.50	66.50	56.50
No. 2 Fdry, Chicago	66.50	66.50	66.50	66.50	56.50
No. 2 Fdry, deld., Phila.	70.91	70.91	70.91	70.51	61.25
No. 2 Fdry, Birm.	62.50	62.50	62.50	62.50	52.88
No. 2 Fdry (Birm.) deld. Cin.	70.20	70.20	70.20	70.20	60.43
Malleable, Valley	66.50	66.50	66.50	66.50	56.50
Malleable, Chicaago	66.50	66.50	66.50	66.50	56.50
Ferromanganese, net ton†	245.00	245.00	245.00	245.00	200.00

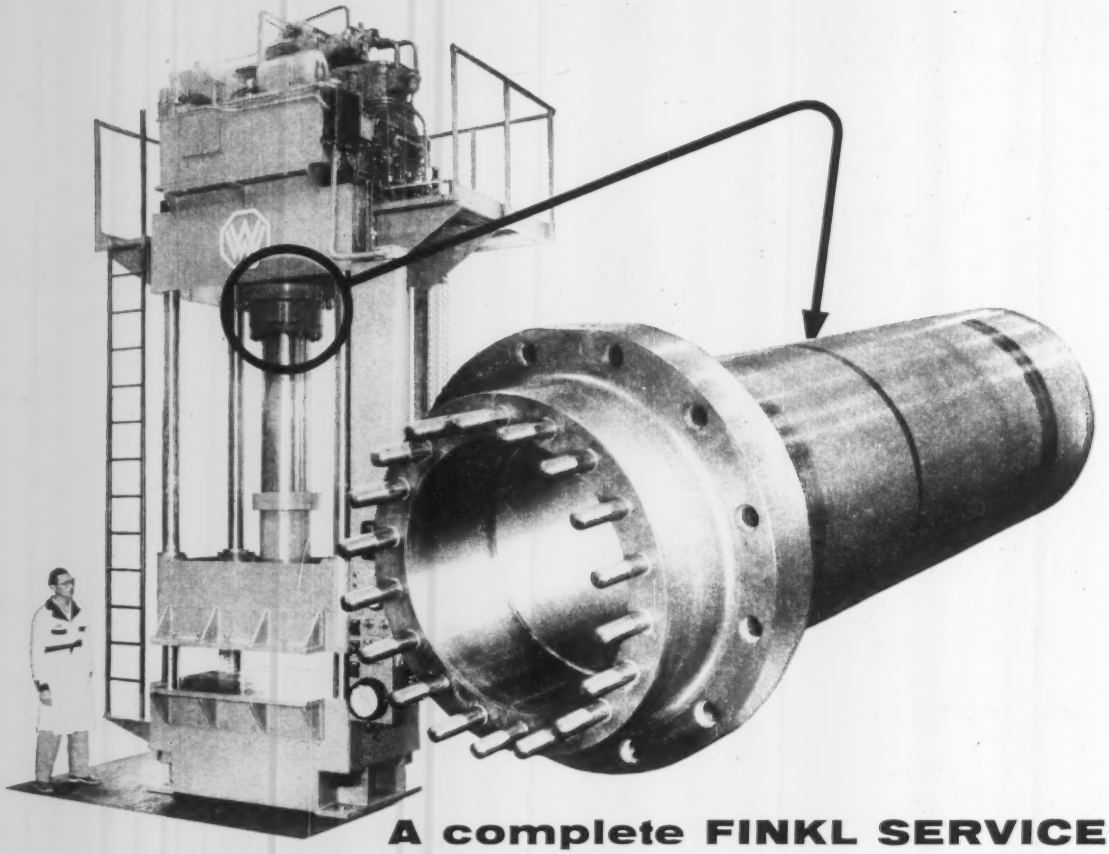
†74-76% Mn, Duquesne, Pa.

SCRAP, Gross Ton (Including broker's commission)

No. 1 Heavy Melt, Pittsburgh	$41.50	$42.50	$44.50	$31.50	$34.50
No. 1 Heavy Melt, E. Pa.	35.00	36.00	40.00	33.50	35.00
No. 1 Heavy Melt, Chicago	42.50	42.50	42.50	32.00	33.50
No. 1 Heavy Melt, Valley	42.50	42.50	43.50	29.50	35.50
No. 1 Heavy Melt, Cleve.	39.00	39.00	40.00	26.50	31.50
No. 1 Heavy Melt, Buffalo	33.50	35.50	35.50	32.50	32.50
Rails, Rerolling, Chicago	63.50	62.50	62.00	48.00	46.00
No. 1 Cast, Chicago	45.50	45.50	45.50	35.50	34.50

COKE, Net Ton

Beehive, Furn., Connlsvl.	$15.25	$15.25	$15.25	$15.25	$14.75
Beehive, Fdry., Connlsvl.	18.25	18.25	18.25	18.25	16.75
Oven, Fdry., Milwaukee	30.50	30.50	30.50	30.50	25.25



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The entire cylinder was handled in our plant. Made of C-1035 steel from our electric furnace melt shop, the part was forged, heat treated, rough and finished machined under one roof. The 17″ bore was ground to $\frac{+.003''}{-.000''}$. Final dimensions, as delivered and installed, were 6′-1″ long with the main body 22″ in diameter.

With modern equipment and skilled craftsman, we do jobs both larger and smaller than the cylinder shown. The important thing is we do all of them well. Next time you are planning a machine part call a Finkl engineer and learn how you can profit by having it done under one roof.

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Steel Prices

Mill prices as reported to STEEL, Dec. 3, cents per pound except as otherwise noted. Changes shown in italics. Code number following mill points indicates producing company. Key to producers, page 156, footnotes, page 158.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)

Munhall,Pa. U5 ..... $76.00

INGOTS, Alloy (NT)

Detroit S41 ..... $82.00
Economy,Pa. B14 ..... 82.00
Farrell,Pa. S3 ..... 82.00
Lowellville,O. S3 ..... 82.00
Midland,Pa. C18 ..... 82.00
Munhall,Pa. U5 ..... 82.00
Sharon,Pa. S3 ..... 82.00

BILLETS, BLOOMS & SLABS Carbon, Rerolling (NT)

Bartonville,Ill. K4 ..... $82.00
Bessemer,Pa. U5 ..... 80.00
Buffalo R2 ..... 80.00
Clairton,Pa. U5 ..... 80.00
Ensley,Ala. T2 ..... 80.00
Fairfield,Ala. T2 ..... 80.00
Fontana,Calif. K1 ..... 90.50
Gary,Ind. U5 ..... 80.00
Johnstown,Pa. B3 ..... 80.00
Lackawanna,N.Y. B2 ..... 80.00
Munhall,Pa. U5 ..... 80.00
Owensboro,Ky. G8 ..... 80.00
S.Chicago,Ill. R2, U5 ..... 80.00
S.Duquesne,Pa. U5 ..... 80.00
Sterling,Ill. N15 ..... 80.00
Youngstown R2 ..... 80.00

Carbon, Forging (NT)

Bessemer,Pa. U5 ..... $99.50
Buffalo R2 ..... 99.50
Canton,O. R2 ..... 102.00
Clairton,Pa. U5 ..... 99.50
Conshohocken,Pa. A3 ..... 104.50
Ensley,Ala. T2 ..... 99.50
Fairfield,Ala. T2 ..... 99.50
Farrell,Pa. S3 ..... 99.50
Fontana,Calif. K1 ..... 109.00
Gary,Ind. U5 ..... 99.50
Geneva,Utah C11 ..... 99.50
Houston S5 ..... 104.50
Johnstown,Pa. B2 ..... 99.50
Lackawanna,N.Y. B2 ..... 99.50
LosAngeles B3 ..... 109.00
Midland,Pa. C18 ..... 99.50
Munhall,Pa. U5 ..... 99.50
Owensboro,Ky. G8 ..... 99.50
Seattle B3 ..... 113.00
Sharon,Pa. S3 ..... 99.50
S.Chicago R2, U5, W14 ..... 99.50
S.Duquesne,Pa. U5 ..... 99.50
S.SanFrancisco B3 ..... 109.00
Warren,O. C17 ..... 99.50

Alloy, Forging (NT)

Bethlehem,Pa. B2 ..... $119.00
Bridgeport,Conn. C32 ..... 119.00
Buffalo R2 ..... 119.00
Canton,O. R2, T7 ..... 119.00
Conshohocken,Pa. A3 ..... 126.00
Detroit S41 ..... 119.00
Economy,Pa. B14 ..... 119.00
Farrell,Pa. S3 ..... 119.00
Fontana,Calif. K1 ..... 140.00
Gary,Ind. U5 ..... 119.00
Houston S5 ..... 124.00
Ind.Harbor,Ind. Y1 ..... 119.00
Johnstown,Pa. B2 ..... 119.00
Lackawanna,N.Y. B2 ..... 119.00
LosAngeles B3 ..... 139.00
Lowellville,O. S3 ..... 119.00
Massillon,O. R2 ..... 119.00
Midland,Pa. C18 ..... 119.00
Munhall,Pa. U5 ..... 119.00
Owensboro,Ky. G8 ..... 119.00
Sharon,Pa. S3 ..... 119.00
S.Chicago R2,U5,W14 ..... 119.00
S.Duquesne,Pa. U5 ..... 119.00
Struthers,O. Y1 ..... 119.00
Warren,O. C17 ..... 119.00

ROUNDS, SEAMLESS TUBE (NT)

Buffalo R2 ..... $122.50
Canton,O. R2 ..... 125.00
Cleveland R2 ..... 122.50
Gary,Ind. U5 ..... 122.50
S.Chicago,Ill. R2, W14 ..... 122.50
S.Duquesne,Pa. U5 ..... 122.50
Warren,O. C17 ..... 122.50

SKELP

Aliquippa,Pa. J5 ..... 5.05
Munhall,Pa. U5 ..... 5.05
Pittsburgh J5 ..... 5.05
Warren,O. R2 ..... 5.05
Youngstown R2, U5 ..... 5.05

WIRE RODS

AlabamaCity,Ala. R2 ..... 6.40
Aliquippa,Pa. J5 ..... 6.40
Alton,Ill. L1 ..... 6.60
Bartonville,Ill. K4 ..... 6.50
Buffalo W12 ..... 6.40
Cleveland A7 ..... 6.40
Donora,Pa. A7 ..... 6.40
Fairfield,Ala. T2 ..... 6.40
Houston S5 ..... 6.65
IndianaHarbor,Ind. Y1 ..... 6.40
Johnstown,Pa. B2 ..... 6.40
Joliet,Ill. A7 ..... 6.40
KansasCity,Mo. S5 ..... 6.65
Kokomo,Ind. C16 ..... 6.50
LosAngeles B3 ..... 7.20
Minnequa,Colo. C10 ..... 6.65
Monessen,Pa. P7 ..... 6.40
N. Tonawanda,N.Y. B11 ..... 6.40
Pittsburg,Calif. C11 ..... 7.20
Portsmouth,O. P12 ..... 6.40
Roebling,N.J. R5 ..... 6.50
S.Chicago,Ill. R2, W14 ..... 6.40
SparrowsPoint,Md. B2 ..... 6.50
Sterling,Ill.(1) N15 ..... 6.40
Sterling,Ill. N15 ..... 6.50
Struthers,O. Y1 ..... 6.40
Worcester,Mass. A7 ..... 6.70

STRUCTURALS

Carbon Steel Std. Shapes

AlabamaCity,Ala. R2 ..... 5.50
Aliquippa,Pa. J5 ..... 5.50
Atlanta A11 ..... 5.70
Bessemer,Ala. T2 ..... 5.50
Bethlehem,Pa. B2 ..... 5.55
Birmingham C15 ..... 5.50
Clairton,Pa. U5 ..... 5.50
Fairfield,Ala. T2 ..... 5.50
Fontana,Calif. K1 ..... 6.30
Gary,Ind. U5 ..... 5.50
Geneva,Utah C11 ..... 5.50
Houston S5 ..... 5.60
Ind.Harbor,Ind. I-2, Y1 ..... 5.50
Johnstown,Pa. B2 ..... 5.55
Joliet,Ill. P22 ..... 5.50
KansasCity,Mo. S5 ..... 5.60
Lackawanna,N.Y. B2 ..... 5.55
LosAngeles B3 ..... 6.20
Minnequa,Colo. C10 ..... 5.50
Munhall,Pa. U5 ..... 5.50
Niles,Calif. P1 ..... 6.25
Phoenixville,Pa. P4 ..... 5.55
Portland,Oreg. O4 ..... 6.25
Seattle B3 ..... 6.25
S.Chicago,Ill. U5, W14 ..... 5.50
S.SanFrancisco B3 ..... 6.15
Sterling,Ill. N15 ..... 5.70
Torrance,Calif. C11 ..... 6.20
Weirton,W.Va. W6 ..... 5.50

Wide Flange

Bethlehem,Pa. B2 ..... 5.55
Clairton,Pa. U5 ..... 5.50
Fontana,Calif. K1 ..... 6.15
IndianaHarbor,Ind. I-2 ..... 5.50
Lackawanna,N.Y. B2 ..... 5.55
Munhall,Pa. U5 ..... 5.50
Phoenixville,Pa. P4 ..... 5.55
S.Chicago,Ill. U5 ..... 5.50
Weirton,W.Va. W6 ..... 5.50

Alloy Std. Shapes

Aliquippa,Pa. J5 ..... 6.80
Clairton,Pa. U5 ..... 6.80
Gary,Ind. U5 ..... 6.80
Houston S5 ..... 6.90
Munhall,Pa. U5 ..... 6.80
S.Chicago,Ill. U5, W14 ..... 6.80

H.S., L.A. Std. Shapes

Aliquippa,Pa. J5 ..... 8.05
Bessemer,Ala. T2 ..... 8.05
Bethlehem,Pa. B2 ..... 8.10
Clairton,Pa. U5 ..... 8.05
Fairfield,Ala. T2 ..... 8.05
Fontana,Calif. K1 ..... 8.85
Gary,Ind. U5 ..... 8.05
Geneva,Utah C11 ..... 8.05
Houston S5 ..... 8.15
Ind.Harbor,Ind. I-2, Y1 ..... 8.05
Johnstown,Pa. B2 ..... 8.10
KansasCity,Mo. S5 ..... 8.15
Lackawanna,N.Y. B2 ..... 8.10
LosAngeles B3 ..... 8.75
Munhall,Pa. U5 ..... 8.05
Seattle B3 ..... 8.80
S.Chicago,Ill. U5, W14 ..... 8.05
S.SanFrancisco B3 ..... 8.70
Struthers,O. Y1 ..... 8.05

H.S., L.A. Wide Flange

Bethlehem,Pa. B2 ..... 8.10
Ind.Harbor,Ind. I-2 ..... 8.05
Lackawanna,N.Y. B2 ..... 8.10
Munhall,Pa. U5 ..... 8.05
S.Chicago,Ill. U5 ..... 8.05

PILING

BEARING PILES

Bethlehem,Pa. B2 ..... 5.55
Ind.Harbor,Ind. I-2 ..... 5.50
Lackawanna,N.Y. B2 ..... 5.55
Munhall,Pa. U5 ..... 5.50
S.Chicago,Ill. I-2, U5 ..... 5.50

STEEL SHEET PILING

Ind.Harbor,Ind. I-2 ..... 6.50
Lackawanna,N.Y. B2 ..... 6.50
Munhall,Pa. U5 ..... 6.50
S.Chicago,Ill. I-2, U5 ..... 6.50
Weirton,W.Va. W6 ..... 6.50

PLATES

PLATES, Carbon Steel

AlabamaCity,Ala. R2 ..... 5.30
Aliquippa,Pa. J5 ..... 5.30
Ashland,Ky.(15) A10 ..... 5.30
Atlanta A11 ..... 5.50
Bessemer,Ala. T2 ..... 5.30
Clairton,Pa. U5 ..... 5.30
Claymont,Del. C22 ..... 5.30
Cleveland J5, R2 ..... 5.30
Coatesville,Pa. L7 ..... 5.30
Conshohocken,Pa. A3 ..... 5.30
Ecorse,Mich. G5 ..... 5.30
Fairfield,Ala. T2 ..... 5.30
Farrell,Pa. S3 ..... 5.30
Fontana,Calif.(30) K1 ..... 6.10
Gary,Ind. U5 ..... 5.30
Geneva,Utah C11 ..... 5.30
GraniteCity,Ill. G4 ..... 5.40
Harrisburg,Pa. P4 ..... 5.30
Houston S5 ..... 5.40
Ind.Harbor,Ind. I-2, Y1 ..... 5.30
Johnstown,Pa. B2 ..... 5.30
Lackawanna,N.Y. B2 ..... 5.30
Mansfield,O. E6 ..... 5.30
Minnequa,Colo. C10 ..... 6.15
Munhall,Pa. U5 ..... 5.30
Newport,Ky. A2 ..... 5.30
Pittsburgh J5 ..... 5.30
Riverdale,Ill. A1 ..... 5.30
Seattle B3 ..... 6.20
Sharon,Pa. S3 ..... 5.30
S.Chicago,Ill. U5, W14 ..... 5.30
SparrowsPoint,Md. B2 ..... 5.30
Sterling,Ill. N15 ..... 5.30
Steubenville,O. W10 ..... 5.30
Warren,O. R2 ..... 5.30
Youngstown U5, Y1 ..... 5.30
Youngstown(27) R2 ..... 5.30

PLATES, Carbon Abras. Resist.

Claymont,Del. C22 ..... 6.75
Fontana,Calif. K1 ..... 7.85
Geneva,Utah C11 ..... 7.05
Houston S5 ..... 7.15
Johnstown,Pa. B2 ..... 7.05
SparrowsPoint,Md. B2 ..... 7.05

PLATES, Wrought Iron

Economy,Pa. B14 ..... 13.55

PLATES, H.S., L.A.

Aliquippa,Pa. J5 ..... 7.95
Ashland,Ky. A10 ..... 7.95
Bessemer,Ala. T2 ..... 7.95
Clairton,Pa. U5 ..... 7.95
Claymont,Del. C22 ..... 7.95
Cleveland J5, R2 ..... 7.95
Coatesville,Pa. L7 ..... 7.95
Conshohocken,Pa. A3 ..... 7.95
Economy,Pa. B14 ..... 7.95
Ecorse,Mich. G5 ..... 7.95
Fairfield,Ala. T2 ..... 7.95
Farrell,Pa. S3 ..... 7.95
Fontana,Calif.(30) K1 ..... 8.75
Gary,Ind. U5 ..... 7.95
Geneva,Utah C11 ..... 7.95
Houston S5 ..... 8.05
Ind.Harbor,Ind. I-2, Y1 ..... 7.95
Johnstown,Pa. B2 ..... 7.95
Munhall,Pa. U5 ..... 7.95
Pittsburgh J5 ..... 7.95
Seattle B3 ..... 8.85
Sharon,Pa. S3 ..... 7.95
S.Chicago,Ill. U5, W14 ..... 7.95
SparrowsPoint,Md. B2 ..... 7.95
Warren,O. R2 ..... 7.95
Youngstown U5, Y1 ..... 7.95

PLATES, ALLOY

Aliquippa,Pa. J5 ..... 7.50
Claymont,Del. C22 ..... 7.50
Coatesville,Pa. L17 ..... 7.50
Economy,Pa. B14 ..... 7.50
Farrell,Pa. S3 ..... 7.50
Fontana,Calif. K1 ..... 8.30
Gary,Ind. U5 ..... 7.50
Houston S5 ..... 7.60
Ind.Harbor,Ind. Y1 ..... 7.50
Johnstown,Pa. B2 ..... 7.50
Lowellville,O. S3 ..... 7.50
Munhall,Pa. U5 ..... 7.50
Newport,Ky. A2 ..... 7.50
Pittsburgh J5 ..... 7.50
Seattle B3 ..... 8.40
Sharon,Pa. S3 ..... 7.50
S.Chicago,Ill. U5, W14 ..... 7.50
SparrowsPoint,Md. B2 ..... 7.50
Youngstown Y1 ..... 7.50

FLOOR PLATES

Cleveland J5 ..... 6.375
Conshohocken,Pa. A3 ..... 6.375
Ind.Harbor,Ind. I-2 ..... 6.375
Munhall,Pa. U5 ..... 6.375
Pittsburgh J5 ..... 6.375
S.Chicago,Ill. U5 ..... 6.375

PLATES, Ingot Iron

Ashland c.l.(15) A10 ..... 5.55
Ashland l.c.l.(15) A10 ..... 6.05
Cleveland c.l. R2 ..... 6.05
Warren,O. c.l. R2 ..... 6.05

BARS

BARS, Hot-Rolled Carbon (Merchant Quality)

Ala.City,Ala.(9) R2 ..... 5.675
Aliquippa,Pa.(9) J5 ..... 5.675
Alton,Ill. L1 ..... 5.875
Atlanta(9) A11 ..... 5.875
Bessemer,Ala.(9) T2 ..... 5.675
Birmingham(9) C15 ..... 5.675
Buffalo(9) R2 ..... 5.675
Canton,O.(23) R2 ..... 6.15
Clairton,Pa.(9) U5 ..... 5.675
Cleveland(9) R2 ..... 5.675
Ecorse,Mich.(9) G5 ..... 5.675
Emeryville,Calif. J7 ..... 6.425
Fairfield,Ala.(9) T2 ..... 5.675
Fairless,Pa.(9) U5 ..... 5.825
Fontana,Calif.(9) K1 ..... 6.375
Gary,Ind.(9) U5 ..... 5.675
Houston(9) S5 ..... 5.925
Ind.Harbor(9) I-2, Y1 ..... 5.675
Johnstown,Pa.(9) B2 ..... 5.675
Joliet,Ill. P22 ..... 5.675
KansasCity,Mo.(9) S5 ..... 5.925
Lackawanna(9) B2 ..... 5.675
LosAngeles(9) B3 ..... 6.375
Massillon,O. (23) R2 ..... 6.15
Midland,Pa.(23) C18 ..... 6.025
Milton,Pa. M18 ..... 5.825
Minnequa,Colo. C10 ..... 6.125
Niles,Calif. P1 ..... 6.375
N.T'wan'a,N.Y.(23) B11 ..... 6.025
Owensboro,Ky.(9) G8 ..... 6.025
Pittsburg,Calif.(9) C11 ..... 6.375
Pittsburgh(9) J5 ..... 5.675
Portland,Oreg. O4 ..... 6.425
Riverdale,Ill.(9) A1 ..... 5.675
Seattle B3, N14 ..... 6.425
S.Chicago(9) R2,U5,W14 ..... 5.675
S.Duquesne,Pa.(9) U5 ..... 5.675
S.SanFran.Calif.(9) B3 ..... 6.425
Sterling,Ill.(1)(9) N15 ..... 5.675
Sterling,Ill.(9) N15 ..... 5.775
Struthers,O.(9) Y1 ..... 5.675
Tonawanda,N.Y. B12 ..... 5.675
Torrance,Calif.(9) C11 ..... 6.375
Warren,O. C17 ..... 6.025
Youngstown(9) R2, U5 ..... 5.675

BARS, Hot-Rolled Alloy

Aliquippa,Pa. J5 ..... 6.725
Bethlehem,Pa. B2 ..... 6.725
Bridgeport,Conn. C32 ..... 6.90
Buffalo R2 ..... 6.725
Canton,O. R2, T7 ..... 6.725
Clairton,Pa. U5 ..... 6.725
Detroit S41 ..... 6.725
Economy,Pa. B14 ..... 6.725
Ecorse,Mich. G5 ..... 6.725
Fairless,Pa. U5 ..... 6.875
Farrell,Pa. S3 ..... 6.725
Fontana,Calif. K1 ..... 7.775
Gary,Ind. U5 ..... 6.725
Houston S5 ..... 6.975
Ind.Harbor,Ind. I-2, Y1 ..... 6.725
Johnstown,Pa. B2 ..... 6.725
KansasCity,Mo. S5 ..... 6.975
Lackawanna,N.Y. B2 ..... 6.725
LosAngeles B3 ..... 7.775
Lowellville,O. S3 ..... 6.725
Massillon,O. R2 ..... 6.725
Midland,Pa. C18 ..... 6.725
Owensboro,Ky. G8 ..... 6.725
Pittsburgh J5 ..... 6.725
Sharon,Pa. S3 ..... 6.725
S.Chicago R2, U5, W14 ..... 6.725
S.Duquesne,Pa. U5 ..... 6.725
Struthers,O. Y1 ..... 6.725
Warren,O. C17 ..... 6.725
Youngstown U5 ..... 6.725

BARS & SMALL SHAPES, H.R. High-Strength, Low-Alloy

Aliquippa,Pa. J5 ..... 8.30
Bessemer,Ala. T2 ..... 8.30
Bethlehem,Pa. B2 ..... 8.30
Clairton,Pa. U5 ..... 8.30
Cleveland R2 ..... 8.30
Ecorse,Mich. G5 ..... 8.30
Fairfield,Ala. T2 ..... 8.30
Fontana,Calif. K1 ..... 9.00
Gary,Ind. U5 ..... 8.30
Houston S5 ..... 8.55
Ind.Harbor,Ind. Y1 ..... 8.30
Johnstown,Pa. B2 ..... 8.30
KansasCity,Mo. S5 ..... 8.55
Lackawanna,N.Y. B2 ..... 8.30
LosAngeles B3 ..... 9.00
Pittsburgh J5 ..... 8.30
Seattle B3 ..... 9.05
S.Chicago,Ill. R2, W14 ..... 8.30
S.Duquesne,Pa. U5 ..... 8.30
S.SanFrancisco B3 ..... 9.05
Struthers,O. Y1 ..... 8.30
Youngstown U5 ..... 8.30

BAR SIZE ANGLES, H.R. Carbon

Bethlehem,Pa.(9) B2 ..... 5.825
Houston(9) S5 ..... 5.925
KansasCity,Mo.(9) S5 ..... 5.925
Lackawanna(9) B2 ..... 5.675
Sterling,Ill. N15 ..... 5.775
Sterling,Ill.(1) N15 ..... 5.675
Tonawanda,N.Y. B12 ..... 5.675

BAR SIZE ANGLES, S. Shapes

Aliquippa,Pa. J5 ..... 5.675
Atlanta A11 ..... 5.875
Joliet,Ill. P22 ..... 5.675
Minnequa,Colo. C10 ..... 6.125
Niles,Calif. P1 ..... 6.375
Pittsburgh J5 ..... 5.675
Portland,Oreg. O4 ..... 6.425
SanFrancisco S7 ..... 6.52
Seattle B3 ..... 6.425

BAR SHAPES, Hot-Rolled Alloy

Aliquippa,Pa. J5 ..... 6.80
Clairton,Pa. U5 ..... 6.80
Gary,Ind. U5 ..... 6.80
Houston S5 ..... 7.05
KansasCity,Mo. S5 ..... 7.05
Pittsburgh J5 ..... 6.80
Youngstown U5 ..... 6.80

BARS, C.F. Leaded (Including leaded extra) Carbon

LosAngeles P2, S30 ..... 11.75*

Alloy

Ambridge,Pa. W18 ..... 10.175
BeaverFalls,Pa. M12 ..... 10.175
Camden,N.J. P13 ..... 10.35
Chicago W18 ..... 10.175
Elyria,O. W8 ..... 10.175
Monaca,Pa. S17 ..... 10.175
Newark,N.J. W18 ..... 10.35
SpringCity,Pa. K3 ..... 10.35

*Grade A; add 0.050c for Grade B.

BARS, Cold-Finished Carbon

Ambridge,Pa. W18 ..... 7.65
BeaverFalls,Pa. M12,R2 ..... 7.65
Birmingham C15 ..... 8.25
Buffalo B5 ..... 7.70
Camden,N.J. P13 ..... 8.10
Carnegie,Pa. C12 ..... 7.65
Chicago W18 ..... 7.65
Cleveland A7, C20 ..... 7.65
Detroit B5, P17 ..... 7.85
Detroit S41 ..... 7.65
Donora,Pa. A7 ..... 7.65
Elyria,O. W8 ..... 7.65
FranklinPark,Ill. N5 ..... 7.65
Gary,Ind. R2 ..... 7.65
GreenBay,Wis. F7 ..... 7.65
Hammond,Ind. J5, L2 ..... 7.65
Hartford,Conn. R2 ..... 8.15
Harvey,Ill. B5 ..... 7.65
LosAngeles(49) S30 ..... 9.10
LosAngeles(49) P2, R2 ..... 9.10
Mansfield,Mass. R2 ..... 8.20
Massillon,O. R2,R8 ..... 7.65
Midland,Pa. C18 ..... 7.65
Monaca,Pa. S17 ..... 7.65
Newark,N.J. W18 ..... 8.10
NewCastle,Pa.(17) B4 ..... 7.65
Pittsburgh J5 ..... 7.65
Plymouth,Mich. P5 ..... 7.90
Putnam,Conn. W18 ..... 8.20
Readville,Mass. C14 ..... 8.20
S.Chicago,Ill. W14 ..... 7.65
SpringCity,Pa. K3 ..... 8.10
Struthers,O. Y1 ..... 7.65
Warren,O. C17 ..... 7.65
Waukegan,Ill. A7 ..... 7.65
WillimanticConn. J5 ..... 8.15
Youngstown F3, Y1 ..... 7.65

BARS, Cold-Finished Carbon (Turned and Ground)

CumberlandMd. (5)..C19 6.55

BARS, Cold-Finished Alloy

Ambridge,Pa. W18 ..... 9.025
BeaverFalls,Pa. M12,R2 ..... 9.025
Bethlehem,Pa. B2 ..... 9.025
Bridgeport,Conn. C32 ..... 9.175
Buffalo B5 ..... 9.025
Camden,N.J. P13 ..... 9.20
Canton,O. T7 ..... 9.025
Carnegie,Pa. C12 ..... 9.025
Chicago W18 ..... 9.025
Cleveland A7, C20 ..... 9.025
Detroit B5, P17 ..... 9.225
Detroit S41 ..... 9.025
Donora,Pa. A7 ..... 9.025
Elyria,O. W8 ..... 9.025
FranklinPark,Ill. N5 ..... 9.025
Gary,Ind. R2 ..... 9.025
GreenBay,Wis. F7 ..... 9.025
Hammond,Ind. J5, L2 ..... 9.025
Hartford,Conn. R2 ..... 9.325
Harvey,Ill. B5 ..... 9.025
Lackawanna,N.Y. B2 ..... 9.025
LosAngeles P2, S30 ..... 11.00
Mansfield,Mass. R5 ..... 9.325
Massillon,O. R2, R8 ..... 9.025
Midland,Pa. C18 ..... 9.025
Monaca,Pa. S17 ..... 9.025
Newark,N.J. W18 ..... 9.20
Plymouth,Mich. P5 ..... 9.225
S.Chicago,Ill. W14 ..... 9.025
SpringCity,Pa. K3 ..... 9.20
Struthers,O. Y1 ..... 9.025
Warren,O. C17 ..... 9.025
Waukegan,Ill. A7 ..... 9.025
Willimantic,Conn. J5 ..... 9.325
Worcester,Mass. A7 ..... 9.325
Youngstown F3, Y1 ..... 9.025

BARS, Reinforcing, Billet (To Fabricators)

AlabamaCity,Ala. R2 ..5.675
Atlanta A11 ..5.675
Birmingham C15 ..5.675
Buffalo R2 ..5.675
Cleveland R2 ..5.675
Ecorse,Mich. G5 ..5.675
Emeryville,Calif. J7 .. 6.425
Fairfield,Ala. T2 ..5.675
Fairless,Pa. U5 ..5.825
Fontana,Calif. K1 .. 6.375
Ft.Worth,Tex.(4)(26)T4 6.125
Gary,Ind. U5 ..5.675
Houston S5 ..5.925
Ind.Harbor,Ind. I-2, Y1 5.675
Johnstown,Pa. B2 ..5.675
Joliet,Ill. P22 ..5.675
KansasCity,Mo. S5 ..5.925
Kokomo,Ind. C16 ..5.775
Lackawanna,N.Y. B2 ..5.675
LosAngeles B3 ..6.375
Madison,Ill. L1 ..5.875
Milton,Pa. M18 ..5.825
Minnequa,Colo. C10 ..6.125
Niles,Calif. P1 ..6.375
Pittsburg,Calif. C11 .. 6.375
Pittsburgh J5 ..5.675
Portland,Oreg. O4 .. 6.425
SandSprings,Okla. S5 .. 5.925
Seattle B3, N14 .. 6.425
S.Chicago,Ill. R2, W14 5.675
S.Duquesne,Pa. U5 ..5.675
S.SanFrancisco B3 .. 6.425
SparrowsPoint,Md. B2 .. 5.675
Sterling,Ill.(1) N15 ..5.675
Sterling,Ill. N15 ..5.775
Struthers,O. Y1 ..5.675
Tonawanda,N.Y. B12 .. 6.10
Torrance,Calif. C11 .. 6.375
Youngstown R2, U5 ..5.675

BARS, Reinforcing, Billet (Fabricated to Consumers)

Baltimore B2 .. 7.42
Boston B2, U8 .. 8.15
Chicago U8 .. 7.41
Cleveland U8 .. 7.39
Houston S5 .. 7.60
Johnstown,Pa. B2 .. 7.33
KansasCity,Mo. S5 .. 7.60
Lackawanna,N.Y. B2 .. 7.35
Marion,O. P11 .. 6.70
Newark,N.J. U8 .. 7.80
Philadelphia U8 .. 7.63
Pittsburgh J5, U8 .. 7.35
SandSprings,Okla. S5 .. 7.60
Seattle B3, N14 .. 7.95
SparrowsPt,Md. B2 .. 7.33
St. Paul U8 .. 8.17
Williamsport,Pa. S19 .. 7.25

BARS, Wrought Iron

Economy,Pa.(S.R.)B14 14.90
Economy,Pa.(D.R.)B14 18.55
Economy(Stayholt)B14 19.00

BARS, Rail Steel

ChicagoHts.(3) C2, I-2 5.575
ChicagoHts.(4)(44) I-2 5.675
ChicagoHts.(4) C2 ..5.675
Franklin,Pa.(3) F5 ..5.575
Franklin,Pa.(4) F5 ..5.675
JerseyShore,Pa.(3) J8 ..5.55
Marion,O.(3) P11 ..5.575
Tonawanda(3) B12 ..5.575
Tonawanda(4) B12 .. 6.10

SHEETS

SHEETS, Hot-Rolled Steel (18 Gage and Heavier)

AlabamaCity,Ala. R2 ..5.10
Allenport,Pa. P7 ..5.10
Aliquippa,Pa. J5 ..5.10
Ashland,Ky.(8) A10 ..5.10
Cleveland J5, R2 ..5.10
Conshohocken,Pa. A3 ..5.15
Detroit(8) M1 ..5.10
Ecorse,Mich. G5 ..5.10
Fairfield,Ala. T2 ..5.10
Fairless,Pa. U5 ..5.15
Farrell,Pa. S3 ..5.10
Fontana,Calif. K1 .. 5.825
Gary,Ind. U5 ..5.10
Geneva,Utah C11 ..5.20
GraniteCity,Ill.(8) G4 ..5.20
Ind.Harbor,Ind. I-2, Y1 5.10
Irvin,Pa. U5 ..5.10
Lackawanna,N.Y. B2 ..5.10
Mansfield,O. E6 ..5.10
Munhall,Pa. U5 ..5.10
Newport,Ky. A2 ..5.10
Niles,O. M21, S3 ..5.10
Pittsburg,Calif. C11 ..5.80
Pittsburgh J5 ..5.10
Portsmouth,O. P12 ..5.10
Riverdale,Ill. A1 ..5.10
Sharon,Pa. S3 ..5.10
S.Chicago,Ill. U5, W14 5.10
SparrowsPoint,Md. B2 ..5.10
Steubenville,O. W10 ..5.10
Warren,O. R2 ..5.10
Weirton,W.Va. W6 ..5.10
Youngstown U5, Y1 ..5.10

SHEETS, H.R. (19 Ga. & Lighter)

Niles,O. M21, S3 .. 6.275

SHEETS, H.R. Alloy

Gary,Ind. U5 ..8.40
Ind.Harbor,Ind. Y1 ..8.40
Irvin,Pa. U5 ..8.40
Munhall,Pa. U5 ..8.40
Newport,Ky. A2 ..8.40
Youngstown U5, Y1 ..8.40

SHEETS, H.R. (14 Ga. & Heavier) High-Strength, Low-Alloy

Aliquippa, Pa. J5 ..7.525
Ashland,Ky. A10 ..7.525
Cleveland J5, R2 ..7.525
Conshohocken,Pa. A3 ..7.575
Ecorse,Mich. G5 ..7.525
Fairfield,Ala. T2 ..7.525
Fairless,Pa. U5 ..7.575
Farrell,Pa. S3 ..7.525
Fontana,Calif. K1 ..8.25
Gary,Ind. U5 ..7.525
Ind.Harbor,Ind. I-2, Y1 7.525
Irvin,Pa. U5 ..7.525
Lackawanna(35) B2 ..7.525
Munhall,Pa. U5 ..7.525
Niles,O. S3 ..7.525
Pittsburgh J5 ..7.525
S.Chicago,Ill. U5, W14 7.525
Sharon,Pa. S3 ..7.525
SparrowsPoint(36) B2 ..7.525
Warren,O. R2 ..7.525
Weirton,W.Va. W6 ..7.525
Youngstown U5, Y1 ..7.525

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

Ashland, Ky.(8) A10 ..5.35
Cleveland R2 ..5.875
Warren,O. R2 ..5.875

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2 ..7.65
Middletown,O. A10 .. 6.775
Warren,O. R2 ..7.65

SHEETS, Cold-Rolled Steel (Commercial Quality)

AlabamaCity,Ala. R2 .. 6.275
Allenport,Pa. P7 .. 6.275
Aliquippa,Pa. J5 .. 6.275
Cleveland J5, R2 .. 6.275
Conshohocken,Pa. A3 .. 6.325
Detroit M1 .. 6.275
Ecorse,Mich. G5 .. 6.275
Fairfield,Ala. T2 .. 6.275
Fairless,Pa. U5 .. 6.325
Follansbee,W.Va. F4 .. 6.275
Fontana,Calif. K1 .. 7.40
Gary,Ind. U5 .. 6.275
GraniteCity,Ill. G4 .. 6.375
Ind.Harbor,Ind. I-2, Y1 6.275
Irvin,Pa. U5 .. 6.275
Lackawanna,N.Y. B2 .. 6.275
Mansfield,O. E6 .. 6.275
Middletown,O. A10 .. 6.275
Newport,Ky. A2 .. 6.275
Pittsburg,Calif. C11 .. 7.225
Pittsburgh J5 .. 6.275
Portsmouth,O. P12 .. 6.275
SparrowsPoint,Md. B2 .. 6.275
Steubenville,O. W10 .. 6.275
Warren,O. R2 .. 6.275
Weirton,W.Va. W6 .. 6.275
Yorkville,O. W10 .. 6.275
Youngstown Y1 .. 6.275

SHEETS, Cold-Rolled, High-Strength, Low-Alloy

Aliquippa,Pa. J5 .. 9.275
Cleveland J5, R2 .. 9.275
Ecorse,Mich. G5 .. 9.275
Fairless,Pa. U5 .. 9.325
Fontana,Calif. K1 .. 10.40
Gary,Ind. U5 .. 9.275
Ind.Harbor,Ind. I-2, Y1 9.275
Irvin,Pa. U5 .. 9.275
Lackawanna(37) B2 .. 9.275
Pittsburgh J5 .. 9.275
SparrowsPoint(38) B2 .. 9.275
Warren,O. R2 .. 9.275
Weirton,W.Va. W6 .. 9.275
Youngstown Y1 .. 9.275

SHEETS, Culvert

	Cu Steel	Cu Fe
Ala.City,Ala. R2	7.225	....
Ashland,Ky. A10	7.225	7.475
Canton,O. R2	7.225	7.75
Fairfield T2	7.225	7.475
Gary,Ind. U5	7.225	7.475
GraniteCity,Ill.G4	7.325	....
Ind.Harbor I-2	7.225	7.475
Irvin,Pa. U5	7.225	7.475
Kokomo,Ind. C16	7.325	....
MartinsFry. W10	7.225	7.475
Pitts.,Calif. C11	7.975	....
SparrowsPt. B2	7.225	....
Pittsburgh J5	7.225	....

SHEETS, Culvert—Pure Iron

Ind.Harbor,Ind. I-2 .. 7.475

SHEETS, Galvanized Steel Hot-Dipped

AlabamaCity,Ala. R2 .. 6.875†
Ashland,Ky. A10 .. 6.875†
Canton,O. R2 .. 6.875†
Dover,O. E6 .. 6.875†
Fairfield,Ala. T2 .. 6.875†
Gary,Ind. U5 .. 6.875†
GraniteCity,Ill. G4 .. 6.975†
Ind.Harbor,Ind. I-2 .. 6.875†
Irvin,Pa. U5 .. 6.875†
Kokomo,Ind. C16 .. 6.975†
MartinsFerry,O. W10 .. 6.875†
Middletown,O. A10 .. 6.875†
Pittsburg,Calif. C11 .. 7.625*
Pittsburgh J5 .. 6.875†
SparrowsPt.,Md. B2 .. 6.875†
Warren,O. R2 .. 6.875†
Weirton,W.Va. W6 .. 6.875*

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Well Casing

Fontana,Calif. K1 ..7.325

SHEETS, Galvanized High-Strength, Low-Alloy

Irvin,Pa. U5 ..10.125
SparrowsPt.(39) B2 ..10.025
Pittsburgh J5 ..10.125

SHEETS, Galvannealed Steel

Canton,O. R2 ..7.275
Irvin,Pa. U5 ..7.275

SHEETS, Galvanized Ingot Iron (Hot-Dipped Continuous)

Ashland,Ky. A10 ..7.125
Middletown,O. A10 ..7.125

SHEETS, Electrogalvanized

Cleveland(28) R2 ..7.65
Niles,O.(28) R2 ..7.65
Youngstown J5 ..7.50
Weirton,W.Va. W6 ..7.50

SHEETS, Aluminum Coated

Butler,Pa. A10 (type 1) 9.525
Butler,Pa. A10 (type 2) 9.625

SHEETS, Enameling Iron

Ashland,Ky. A10 ..6.775
Cleveland R2 ..6.775
Fairfield,Ala. T2 ..6.775
Gary,Ind. U5 ..6.775
GraniteCity,Ill. G4 ..6.875
Ind.Harbor,Ind. I-2,Y1 6.775
Irvin,Pa. U5 ..6.775
Middletown,O. A10 ..6.775
Niles,O. M21, S3 ..6.775
Youngstown Y1 ..6.775

BLUED STOCK, 29 Gage

Dover,O. E6 ..8.70
Follansbee,W.Va. F4 ..8.70
Ind.Harbor,Ind. I-2 ..8.70
Mansfield,O. E6 ..8.70
Warren,O. R2 ..8.70
Yorkville,O. W10 ..8.70

SHEETS, Long Terne, Steel (Commercial Quality)

BeechBottom,W.Va.W10 7.225
Gary,Ind. U5 ..7.225
Mansfield,O. E6 ..7.225
Middletown,O. A10 ..7.225
Niles,O. M21, S3 ..7.225
Warren,O. R2 ..7.225
Weirton,W.Va. W6 ..7.225

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 ..7.625

Key To Producers

A1 Acme Steel Co.
A2 Acme-Newport Steel Co.
A3 Allen Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Div., H. K. Porter Co. Inc.
A6 American Shim Steel Co.
A7 American Steel & Wire Div., U. S. Steel Corp.
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Steel Div. Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div. Buffalo Eclipse Corp.
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div., H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Plant, Wickwire Spencer Steel Div., Colo. Fuel & Iron
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.
C32 Carpenter Steel of N.Eng.

D2 Detroit Steel Corp.
D4 Disston Div., H. K. Porter Co. Inc.
D6 Driver-Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 Eastern Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire-Reeves Steel Corp.
E10 Enamel Prod. & Plating

F2 Firth Sterling Inc.
F3 Fitzsimmons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.
G8 Green River Steel Corp.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins Steel Tube Works
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L6 Lone Star Steel Co.
L7 Lukens Steel Co.
L8 Leschen Wire Rope Div., H. K. Porter Co. Inc.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M14 McInnes Steel Co.
M16 Md. Fine & Special Wire
M17 Metal Forming Corp.
M18 Milton Steel Div., Merritt-Chapman&Scott
M21 Mallory-Sharon Metals Corp.
M22 Mill Strip Products Co.

N1 National-Standard Co.
N2 National Supply Co.
N3 National Tube Div., U. S. Steel Corp.
N5 Nelsen Steel & Wire Co.
N6 New England High Carbon Wire Co.
N8 Newman-Crosby Steel
N14 Northwest. Steel Rolling Mills Inc.
N15 Northwestern S.&W. Co.
N20 Neville Ferro Alloy Co.

O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co., Sub. of Barium Steel Corp.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Div., Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div. American Chain & Cable
P17 Plymouth Steel Corp.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P22 Phoenix Mfg. Co.
P24 Phil. Steel & Wire Corp.

R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R8 Reliance Div., Eaton Mfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Div., Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simmons Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Div., Copperweld Steel Co.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Prod.
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.
S40 Seneca Steel Service
S41 Stainless & Strip Div., J&L Steel Corp.
S42 Southern Elec. Steel Co.

T2 Tenn. Coal & Iron Div., U. S. Steel Corp.
T3 Tenn. Products & Chemical Corp.
T4 Texas Steel Co.
T5 Thomas Strip Div., Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am Rad & Stan. San.
T13 Tube Methods Inc.
T19 Techalloy Co. Inc.

U3 Union Wire Rope Corp.
U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U. S. Steel Supply Div., U. S. Steel Corp.

V2 Vanadium-Alloys Steel
V3 Vulcan-Kidd Steel Div., H. K. Porter Co.

W1 Wallace Barnes Steel Div., Associated Spring Corp.
W2 Wallingford Steel Corp.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W8 Western Automatic Machine Screw Co.
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.

Y1 Youngstown Sheet & Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2 ..5.10
Allenport,Pa. P7 ..5.10
Alton,Ill. L1 ..5.30
Ashland,Ky.(8) A10 ..5.10
Atlanta A11 ..5.10
Bessemer,Ala. T2 ..5.10
Birmingham C15 ..5.10
Buffalo(27) R2 ..5.10
Conshohocken,Pa. A3 ..5.15
Detroit M1 ..5.10
Ecorse,Mich. G5 ..5.10
Fairfield,Ala. T2 ..5.10
Farrell,Pa. S3 ..5.10
Fontana,Calif. K1 ..5.825
Gary,Ind. U5 ..5.10
Ind.Harbor,Ind. I-2, Y1 ..5.10
Johnstown,Pa.(25) B2 ..5.10
Lackaw'na,N.Y.(25) B2 ..5.10
LosAngeles(25) B3 ..5.85
LosAngeles C1 ..8.60
Minnequa,Colo. C10 ..6.20
Riverdale,Ill. A1 ..5.10
SanFrancisco S7 ..6.60
Seattle(25) B3 ..6.10
Seattle N11 ..6.60
Sharon,Pa. S3 ..5.10
S.Chicago W14 ..5.10
S.SanFrancisco(25) B3 ..5.85
SparrowsPoint,Md. B2 ..5.10
Torrance,Calif. C11 ..5.85
Warren,O. R2 ..5.10
Weirton,W.Va. W6 ..5.10
Youngstown U5 ..5.10

STRIP, Hot-Rolled Alloy

Carnegie,Pa. S18 ..8.40
Farrell,Pa. S3 ..8.40
Gary,Ind. U5 ..8.40
Houston S5 ..8.65
Ind.Harbor,Ind. Y1 ..8.40
KansasCity,Mo. S5 ..8.65
LosAngeles B3 ..9.60
Lowellville,O. S3 ..8.40
Newport,Ky. A2 ..8.40
Sharon,Pa. A2, S3 ..8.40
S.Chicago,Ill. W14 ..8.40
Youngstown U5, Y1 ..8.40

STRIP, Hot-Rolled High-Strength, Low-Alloy

Ashland,Ky. A10 ..7.575
Bessemer,Ala. T2 ..7.575
Conshohocken,Pa. A3 ..7.575
Ecorse,Mich. G5 ..7.575
Fairfield,Ala. T2 ..7.575
Farrell,Pa. S3 ..7.575
Gary,Ind. U5 ..7.575
Ind.Harbor,Ind. I-2,Y1 ..7.575
Lackawanna,N.Y. B2 ..7.575
LosAngeles(25) B3 ..8.325
Seattle(25) B3 ..8.575
Sharon,Pa. S3 ..7.575
S.Chicago,Ill. W14 ..7.575
S.SanFrancisco(25) B3 ..8.325
SparrowsPoint,Md. B2 ..7.575
Warren,O. R2 ..7.575
Weirton,W.Va. W6 ..7.575
Youngstown U5, Y1 ..7.575

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10 ..5.35
Warren,O. R2 ..5.875

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6 ..7.425
Baltimore T6 ..7.425
Boston T6 ..7.975
Buffalo S40 ..7.425
Cleveland A7, J5 ..7.425
Dearborn,Mich. S3 ..7.425
Detroit D2, M1, P20 ..7.425
Dover, O. G6 ..7.425
Evanston,Ill. M22 ..7.525
Farrell,Pa. S3 ..7.425
Follansbee,W.Va. F4 ..7.425
Fontana,Calif. K1 ..9.20
FranklinPark,Ill T6 ..7.525
Ind.Harbor,Ind. Y1 ..7.425
Indianapolis S41 ..7.575
LosAngeles C1, S41 ..9.30
McKeesport,Pa. E10 ..7.525
NewBedford,Mass. R10 ..7.875
NewBritain,Conn. S15 ..7.875
NewCastle,Pa. B4, E5 ..7.425
NewHaven,Conn. D2 ..7.875
NewKensington,Pa. A6 ..7.425
Pawtucket,R.I. R3 ..7.975
Pawtucket,R.I. N8 ..7.975
Philadelphia P24 ..7.875
Pittsburgh J5 ..7.425
Riverdale,Ill. A1 ..7.525
Rome,N.Y.(32) R6 ..7.425
Sharon,Pa. S3 ..7.425
Trenton,N.J.(31) R5 ..8.875
Wallingford,Conn. W2 ..7.875
Warren,O. R2, T5 ..7.425
Worcester,Mass. A7 ..7.975
Youngstown S41, Y1 ..7.425

STRIP, Cold-Rolled Alloy

Boston T6 ..15.90
Carnegie,Pa. S18 ..15.55
Cleveland A7 ..15.55
Dover,O. G6 ..15.55
Farrell,Pa. S3 ..15.55
FranklinPark,Ill. T6 ..15.55
Harrison,N.J. C18 ..15.55
Indianapolis S41 ..15.70
LosAngeles S41 ..17.75
Lowellville,O. S3 ..15.55
Pawtucket,R.I. N8 ..15.90
Riverdale,Ill. A1 ..15.55
Sharon,Pa. S3 ..15.55
Worcester,Mass. A7 ..15.85
Youngstown S41 ..15.55

STRIP, Cold-Rolled High-Strength, Low-Alloy

Cleveland A7 ..10.80
Dearborn,Mich. S3 ..10.80
Dover,O. G6 ..10.80
Farrell,Pa. S3 ..10.80
Ind.Harbor,Ind. Y1 ..10.80
Sharon,Pa. S3 ..10.80
Warren,O. R2 ..10.80

STRIP, Cold-Finished Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	9.50	10.70	12.90	15.90	18.85
Boston T6	9.50	10.70	12.90	15.90	18.85
Bristol,Conn. W1	...	10.70	12.90	16.10	19.30
Carnegie,Pa. S18	8.95	10.40	12.60	15.60	....
Cleveland A7	8.95	10.40	12.60	15.60	18.55
Dearborn,Mich. S3	9.05	10.50	12.70	....	....
Detroit D2	9.05	10.50	12.70	15.70	....
Dover,O. G6	8.95	10.40	12.60	15.60	18.55
Evanston,Ill. M22	8.95	10.40	12.60	15.60	....
Farrell,Pa. S3	8.95	10.40	12.60	15.60	18.55
Fostoria,O. S1	10.05	10.40	12.60	15.60	....
FranklinPark,Ill. T6	9.05	10.40	12.60	15.60	18.55
Harrison,N.J. C18	....	....	12.90	16.10	19.30
Indianapolis S41	9.10	10.55	12.60	15.60	18.55
LosAngeles C1	11.15	12.60	14.80	17.80	....
LosAngeles S41	11.15	12.60	14.80	....	....
NewBritain,Conn. S15	9.40	10.70	12.90	15.90	18.85
NewCastle,Pa. B4, E5	8.95	10.40	12.60	15.60	....
NewHaven,Conn. D2	9.40	10.70	12.90	15.90	....
NewKensington,Pa. A6	8.95	10.40	12.60	15.60	....
New York W3	....	10.70	12.90	16.10	19.30
Pawtucket,R.I. N8	9.50	10.70	12.90	15.90	18.85
Riverdale,Ill. A1	9.05	10.40	12.60	15.60	18.55
Rome,N.Y.(32) R6	8.95	10.40	12.60	15.60	18.55
Sharon,Pa. S3	8.95	10.40	12.60	15.60	18.55
Trenton,N.J. R5	....	10.70	12.90	15.90	18.85
Wallingford,Conn. W2	9.40	10.70	12.90	15.90	18.75
Warren,O. T5	8.95	10.40	12.60	15.60	18.55
Worcester,Mass. A7, T6	9.50	10.70	12.90	15.90	18.85
Youngstown S41	8.95	10.10	12.60	15.60	18.55

Spring Steel (Tempered)

	Up to 0.80C	0.81-1.05C	1.06-1.35C
Bristol, Conn. W1	18.85	22.95	27.80
Buffalo W12	18.85	....	....
Fostoria,O. S1	19.05	22.15	....
FranklinPark,Ill. T6	19.20	23.30	28.15
Harrison,N.J. C18	18.85	22.95	27.80
New York W3	18.85	22.95	27.80
Palmer,Mass. W12	18.85	....	....
Trenton,N.J. R5	18.85	22.95	27.80
Worcester,Mass. A7, T6	18.85	22.95	27.80
Youngstown S41	19.20	23.30	28.15

Weirton,W.Va. W6 ..10.80
Youngstown Y1 ..10.80

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2 ..8.175

STRIP, C.R. Electrogalvanized

Cleveland A7 ..7.425*
Dover,O. G6 ..7.425*
Evanston,Ill. M22 ..7.525*
McKeesport,Pa. E10 ..7.50*
Riverdale,Ill. A1 ..7.525*
Warren,O. B9, S3, T5 ..7.425*
Worcester,Mass. A7 ..7.975
Youngstown S41 ..7.425*

*Plus galvanizing extras.

STRIP, Galvanized (Continuous)

Farrell,Pa. S3 ..7.50
Sharon,Pa. S3 ..7.50

TIGHT COOPERAGE HOOP

Atlanta A11 ..5.65
Farrell,Pa. S3 ..5.525
Riverdale,Ill. A1 ..5.675
Sharon,Pa. S3 ..5.525
Youngstown U5 ..5.525

TIN MILL PRODUCTS

TIN PLATE, Electrolytic (Base Box)

	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$9.10	$9.35	$9.75
Fairfield,Ala. T2	9.20	9.45	9.85
Fairless,Pa. U5	9.20	9.45	9.85
Fontana,Calif. K1	9.75	10.00	10.40
Gary,Ind. U5	9.10	9.35	9.75
GraniteCity,Ill. G4	9.20	9.45	9.60
IndianaHarbor,Ind. I-2, Y1	9.10	9.35	9.75
Irvin,Pa. U5	9.10	9.35	9.75
Niles,O. R2	9.10	9.35	9.75
Pittsburg,Calif. C11	9.75	10.00	10.40
SparrowsPoint,Md. B2	9.10	9.35	9.75
Yorkville,O. W10	9.10	9.35	9.75

ELECTROLYTIC TIN-COATED SHEET (20-27 Ga.; Dollars per 100 lb)

Aliquippa,Pa. J5	7.90	8.10
Niles,O. R2	7.90	8.10

TIN PLATE, American 1.25 lb / 1.50 lb

	1.25 lb	1.50 lb
Aliquippa,Pa.J5	$10.40	$10.65
Fairfield,Ala. T2	10.50	10.75
Fairless,Pa. U5	10.50	10.75
Fontana,Calif.K1	11.05	11.30
Gary,Ind. U5	10.40	10.65
Ind.Harb. Y1	10.40	10.65
Pitts.,Calif. C11	11.05	11.30
Sp.Pt.,Md. B2	10.40	10.65
Weirton,W.Va.W6	10.40	10.65
Yorkville,O. W10	10.40	10.65

BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$8.20
Fairfield,Ala. T2	8.30
Fairless,Pa. U5	8.30
Fontana,Calif. K1	8.85
Gary,Ind. U5	8.20
GraniteCity,Ill. G4	8.30
Ind.Harbor,Ind. I-2, Y1	8.20
Irvin,Pa. U5	8.20
Niles,O. R2	8.20
Pittsburg,Calif. C11	8.85
SparrowsPoint,Md. B2	8.25
Weirton,W.Va. W6	8.20
Yorkville,O. W10	8.20

HOLLOWARE ENAMELING Black Plate (29 Gage)

Aliquippa,Pa. J5	7.85
Gary,Ind. U5	7.85
GraniteCity,Ill. G4	7.95
Ind.Harbor,Ind. Y1	7.85
Irvin,Pa. U5	7.85
Yorkville,O. W10	7.85

MANUFACTURING TERNES (Special Coated, Base Box)

Gary,Ind. U5	$9.70
Irvin,Pa. U5	9.70

ROOFING SHORT TERNES (8 lb Coated, Base Box)

Gary,Ind. U5	$11.25

SILICON STEEL

C.R. COILS & CUT LENGTHS (22 Ga.)

Fully Processed (Semiprocessed ½c lower)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	....	11.70	12.40	13.55	14.65
Brackenridge,Pa. A4	....	....	12.40	13.55	14.65
GraniteCity,Ill. G4	9.975*	11.30*	12.00*	13.15*	....
IndianaHarbor,Ind. I-2	9.875*	11.20*	11.90*	13.05*	....
Mansfield,O. E6	9.875*	11.70	12.40	13.55	14.65
Newport,Ky. A2	9.875	11.70*	12.40*	13.55*	14.65*
Niles,O. M21	9.875*	11.70	12.40	13.55	....
Vandergrift,Pa. U5	9.875*	11.70	12.40	13.55	14.65
Warren,O. R2	9.875*	11.70	12.40	13.55	14.65
Zanesville,O. A10	....	11.70†	12.40	13.55	14.65
					Stator
Vandergrift,Pa. U5	....	....	....	....	8.10
Mansfield,O. E6	....	....	....	....	8.10

SHEETS (22 Ga., coils & cut lengths) Fully Processed (Semiprocessed ½c lower)	T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	15.70	16.30	16.80	17.85
Vandergrift,Pa. U5	15.70	16.30	16.80	17.85
Zanesville,O. A10	15.70	16.30	16.80	17.85

C.R. COILS & CUT LENGTHS (22 Ga.)	Grain Oriented T-100	T-90	T-80	T-73	T-66	T-72
Brackenridge,Pa. A4	18.10	19.70	20.20	20.70	15.70††	
Butler,Pa. A10	....	19.70	20.20	20.70	....	
Vandergrift,Pa. U5	17.10	18.10	19.70	20.20	20.70	15.70
Warren,O. R2	....	....	....	....	....	15.70‡

*Semiprocessed. †Fully processed only. ‡Coils, annealed, semiprocessed½c lower. ††Coils only.

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2 ..8.00
Aliquippa,Pa. J5 ..8.00
Alton,Ill. L1 ..8.20
Atlanta A1 ..8.00
Bartonville,Ill. K4 ..8.10
Buffalo W12 ..8.00
Chicago W13 ..8.00
Cleveland A7, C20 ..8.00
Crawfordsville,Ind. M8 ..8.10
Donora,Pa. A7 ..8.00
Duluth A7 ..8.00
Fairfield,Ala. T2 ..8.00
Fostoria,O.(24) S1 ..8.10
Houston S5 ..8.25
Jacksonville,Fla. M8 ..8.35
Johnstown,Pa. B2 ..8.00
Joliet,Ill. A7 ..8.00
KansasCity,Mo. S5 ..8.25
Kokomo,Ind. C16 ..8.10
LosAngeles B3 ..8.95
Minnequa,Colo. C10 ..8.25
Monessen,Pa. P7, P16 ..8.00
Palmer,Mass. W12 ..8.30
Pittsburg,Calif. C11 ..8.95
Portsmouth,O. P12 ..8.00
Rankin,Pa. A7 ..8.00
S.Chicago,Ill. R2 ..8.00
S.SanFrancisco C10 ..8.95
SparrowsPoint, Md. B2 ..8.10
Sterling,Ill.(1) N15 ..8.00
Sterling,Ill. N15 ..8.10
Struthers,O. Y1 ..8.00
Waukegan,Ill. A7 ..8.00
Worcester,Mass. A7 ..8.30

WIRE, Cold Heading Carbon

Elyria,O. W8 ..8.00

WIRE, Gal'd., for ACSR

Bartonville,Ill. K4 ..12.65
Buffalo W12 ..13.40
Cleveland A7 ..12.65
Donora,Pa. A7 ..12.65
Duluth A7 ..12.65
Johnstown,Pa. B2 ..13.40
Minnequa,Colo. C10 ..12.775
Monessen,Pa. P7, P16 ..12.65
Muncie,Ind. I-7 ..13.60
NewHaven,Conn. A7 ..12.95
Palmer,Mass. W12 ..13.70
Pittsburg,Calif. C11 ..13.45
Portsmouth,O. P12 ..12.65
Roebling,N.J. R5 ..12.95
SparrowsPt.,Md. B2 ..13.50
Struthers,O. Y1 ..13.40
Trenton,N.J. A7 ..12.95
Waukegan,Ill. A7 ..12.65
Worcester,Mass. A7 ..12.95

WIRE, Upholstery Spring

Aliquippa,Pa. J5 ..9.75
Alton,Ill. L1 ..9.95
Buffalo W12 ..9.75
Cleveland A7 ..9.75
Donora,Pa. A7 ..9.75
Duluth A7 ..9.75
Johnstown,Pa. B2 ..9.75
KansasCity,Mo. S5 ..10.00
LosAngeles B3 ..10.70
Minnequa,Colo. C10 ..9.95
Monessen,Pa. P7, P16 ..9.75
NewHaven,Conn. A7 ..10.05
Palmer,Mass. W2 ..10.05
Pittsburg,Calif. C11 ..10.70
Portsmouth,O. P12 ..9.75
Roebling,N.J. R5 ..10.05
S.Chicago,Ill. R2 ..9.75
S.SanFrancisco C10 ..10.70
SparrowsPt.,Md. B2 ..9.85
Struthers,O. Y1 ..9.75
Trenton,N.J. A7 ..10.05
Waukegan,Ill. A7 ..10.05
Worcester,Mass. A7 ..10.05

WIRE, MB Spring, High-Carbon

Aliquippa,Pa. J5 ..9.75
Alton,Ill. L1 ..9.95
Bartonville,Ill. K4 ..9.85
Buffalo W12 ..9.75
Cleveland A7 ..9.75
Donora,Pa. A7 ..9.75
Duluth A7 ..9.75
Fostoria,O. S1 ..9.80
Johnstown,Pa. B2 ..9.75
KansasCity,Mo. S5 ..10.00
LosAngeles B3 ..10.70
Milbury,Mass.(12) N6 ..10.05
Minnequa,Colo. C10 ..9.95
Monessen,Pa. P7, P16 ..9.75
Muncie,Ind. I-7 ..9.95
Palmer,Mass. W12 ..10.05
Pittsburg,Calif. C11 ..10.70
Portsmouth,O. P12 ..9.75
Roebling,N.J. R5 ..10.05
S.Chicago,Ill. R2 ..9.75
S.SanFrancisco C10 ..10.70
SparrowsPt.,Md. B2 ..9.85
Struthers,O. Y1 ..9.75
Trenton,N.J. A7 ..10.05
Wor'ster,Mass.A7,J4,T6 ..10.05

WIRE, Fine & Weaving(8" Coils)

Alton,Ill. L1 ..16.50
Bartonville,Ill. K4 ..16.40
Chicago W13 ..16.30
Cleveland A7 ..16.30
Crawfordsville,Ind. M8 ..16.40
Fostoria,O. S1 ..16.30
Houston S5 ..16.55
Jacksonville,Fla. M8 ..16.65
Johnstown,Pa. B2 ..16.30
KansasCity,Mo. S5 ..16.55
Kokomo,Ind. C16 ..16.30
Minnequa,Colo. C10 ..16.55
Monessen,Pa. P16 ..16.30
Muncie,Ind. I-7 ..16.50
Palmer,Mass. W12 ..16.60
S.SanFrancisco C10 ..17.15
Waukegan,Ill. A7 ..16.30
Worcester,Mass. A7, J6 ..16.60

WIRE, Tire Bead

Bartonville,Ill. K4 ..17.15
Monessen,Pa. P16 ..17.15
Roebling,N.J. R5 ..17.65

ROPE WIRE (A)

Bartonville,Ill. K4 ..13.45
Buffalo W12 ..13.45
Fostoria,O. S1 ..13.45
Johnstown,Pa. B2 ..13.45
Monessen,Pa. P7 ..13.45
Muncie,Ind. I-7 ..13.65
Palmer,Mass. W12 ..13.75
Portsmouth,O. P12 ..13.45
Roebling,N.J. R5 ..13.75
St.Louis L8 ..13.45
SparrowsPt.,Md. B2 ..13.55
Struthers,O. Y1 ..13.45
Worcester,Mass. J4 ..13.75
(A) Plow and Mild Plow; add 0.25c for Improved Plow

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	12.35
Baltimore T6	12.65
Boston T6	12.65
Buffalo W12	12.35
Chicago W13	12.45
Cleveland A7	12.35
Crawfordsville,Ind. M8	12.35
Dover,O. G6	12.35
Farrell,Pa. S3	11.65
Fostoria,O. S1	12.35
FranklinPark,Ill. T6	12.45
Kokomo,Ind. C16	12.35
Massillon,O. R8	12.35
Milwaukee C23	12.55
Monessen,Pa. P7, P16	12.35
Palmer,Mass. W12	12.65
Pawtucket,R.I. N8	11.95
Philadelphia P24	12.65
Riverdale,Ill. A1	12.45
Rome,N.Y. R6	12.35
Sharon,Pa. S3	12.35
Trenton,N.J. R5	12.65
Warren,O. B9	12.35
Worcester,Mass. A7,T6	12.65

NAILS, Stock

	Col.
AlabamaCity,Ala. R2	173
Aliquippa,Pa. J5	173
Atlanta A11	175
Bartonville,Ill. K4	175
Chicago W13	173
Cleveland A9	173
Crawfordsville,Ind. M8	175
Donora,Pa. A7	173
Duluth A7	173
Fairfield,Ala. T2	173
Houston S5	178
Jacksonville,Fla. M8	175
Johnstown,Pa. B2	173
Joliet,Ill. A7	173
KansasCity,Mo. S5	178
Kokomo,Ind. C16	175
Minnequa,Colo. C10	178
Monessen,Pa. P7	173
Pittsburg,Calif. C11	192
Rankin,Pa. A7	173
S.Chicago,Ill. R2	173
SparrowsPt.,Md. B2	175
Sterling,Ill. (7) N15	175
Worcester,Mass. A7	179

(To Wholesalers; per cwt)

Galveston,Tex. D7	$10.30

NAILS, Cut (100 lb keg)
To Dealers (33)

Wheeling,W.Va. W10	$9.80

POLISHED STAPLES

	Col.
AlabamaCity,Ala. R2	175
Aliquippa,Pa. J5	173
Atlanta A11	177
Bartonville,Ill. K4	177
Crawfordsville,Ind. M8	177
Donora,Pa. A7	173
Duluth A7	173
Fairfield,Ala. T2	173
Houston S5	180
Jacksonville,Fla. M8	177
Johnstown,Pa. B2	175
Joliet,Ill. A7	173
KansasCity,Mo. S5	180
Kokomo,Ind. C16	177
Minnequa,Colo. C10	180
Pittsburg,Calif. C11	194
Rankin,Pa. A7	173
S.Chicago,Ill. R2	175
SparrowsPt.,Md. B2	177
Sterling,Ill. (7) N15	175
Worcester,Mass. A7	181

TIE WIRE, Automatic Baler (14½ Ga.) (per 97 lb Net Box)
Coil No. 3150

AlabamaCity,Ala. R2	$10.26
Atlanta A11	10.36
Bartonville,Ill. K4	10.36
Buffalo W12	10.26
Chicago W13	10.26
Crawfordsville,Ind. M8	10.36
Donora,Pa. A7	10.26
Duluth A7	10.26
Fairfield,Ala. T2	10.26
Houston S5	10.51
Jacksonville,Fla. M8	10.36
Johnstown,Pa. B2	10.26
Joliet,Ill. A7	10.26
KansasCity,Mo. S5	10.51
Kokomo,Ind. C16	10.36
LosAngeles B3	11.05
Minnequa,Colo. C10	10.51
Pittsburg,Calif. C11	11.04
S.Chicago,Ill. R2	10.26
S.SanFrancisco C10	11.04
SparrowsPt.,Md. B2	10.36
Sterling,Ill. (37) N15	10.36

Coil No. 6500 Stand.

AlabamaCity,Ala. R2	$10.60
Atlanta A11	10.70
Bartonville,Ill. K4	10.70
Buffalo W12	10.60
Chicago W13	10.60
Crawfordsville,Ind. M8	10.70
Donora,Pa. A7	10.60
Duluth A7	10.60
Fairfield,Ala. T2	10.60
Houston S5	10.85
Jacksonville,Fla. M8	10.70
Johnstown,Pa. B2	10.60
Joliet,Ill. A7	10.60
KansasCity,Mo. S5	10.85
Kokomo,Ind. C16	10.70
LosAngeles B3	10.85
Minnequa,Colo. C10	10.85
Pittsburg,Calif. C11	11.40
S.Chicago,Ill. R2	10.60
S.SanFrancisco C10	11.40
SparrowsPt.,Md. B2	10.70
Sterling,Ill.(37) N15	10.70

Coil No. 6500 Interim

AlabamaCity,Ala. R2	$10.65
Atlanta A11	10.75
Bartonville,Ill. K4	10.75
Buffalo W12	10.65
Chicago W13	10.65
Crawfordsville,Ind. M8	10.75
Donora,Pa. A7	10.65
Duluth A7	10.65
Fairfield,Ala. T2	10.65
Houston S5	10.90
Jacksonville,Fla. M8	10.75
Johnstown,Pa. B2	10.65
Joliet,Ill. A7	10.65
KansasCity,Mo. S5	10.90
Kokomo,Ind. C16	10.75
LosAngeles B3	11.45
Minnequa,Colo. C10	10.90
Pittsburg,Calif. C11	11.45
S.Chicago,Ill. R2	10.65
S.SanFrancisco C10	11.45
SparrowsPt.,Md. B2	10.75
Sterling,Ill.(37) N15	10.75

BALE TIES, Single Loop

	Col.
AlabamaCity,Ala. R2	212
Atlanta A11	214
Bartonville,Ill. K4	214
Crawfordsville,Ind. M8	214
Donora,Pa. A7	212
Duluth A7	212
Fairfield,Ala. T2	212
Houston S5	217
Jacksonville,Fla. M8	214
Joliet,Ill. A7	212
KansasCity,Mo. S5	217
Kokomo,Ind. C16	214
Minnequa,Colo. C10	217
Pittsburg,Calif. C11	236
S.SanFrancisco C10	236
SparrowsPt.,Md. B2	214
Sterling,Ill.(7) N15	214

FENCE POSTS

Birmingham C15	177
ChicagoHts.,Ill. C2, I-2	177
Duluth A7	177
Franklin,Pa. F5	177
Johnstown,Pa. B2	177
Marion,O. P11	177
Minnequa,Colo. C10	182
Sterling,Ill.(1) N15	177
Tonawanda,N.Y. B12	172

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	193**
Aliquippa,Pa. J5	190§
Atlanta A11	198§
Bartonville,Ill. K4	198
Crawfordsville,Ind. M8	198
Donora,Pa. A7	193†
Duluth A7	193†
Fairfield,Ala. T2	193†
Houston S5	198**
Jacksonville,Fla. M8	198
Johnstown,Pa. B2	196§
Joliet,Ill. A7	193†
KansasCity,Mo. S5	198**
Kokomo,Ind. C16	195†
Minnequa,Colo. C10	198**
Monessen,Pa. P7	196§
Pittsburg,Calif. C11	213†
Rankin,Pa. A7	193†
S.Chicago,Ill. R2	193**
S.SanFrancisco C10	213*
SparrowsPoint,Md. B2	198§
Sterling,Ill.(7) N15	198††

WOVEN FENCE, 9-15 Ga.

	Col.
Ala.City,Ala. R2	187**
Aliq'ppa,Pa.9-11½ga.J5	190§
Atlanta A11	192§
Bartonville,Ill. K4	192
Crawfordsville,Ind. M8	192
Donora,Pa. A7	187†
Duluth A7	187†
Fairfield,Ala. T2	187†
Houston S5	192**
Jacksonville,Fla. M8	192
Johnstown,Pa.(43) B2	190§
Joliet,Ill. A7	187†
KansasCity,Mo. S5	192**
Kokomo,Ind. C16	189†
Minnequa,Colo. C10	192**
Pittsburg,Calif. C11	210†
Rankin,Pa. A7	187†
S.Chicago,Ill. R2	187**
Sterling,Ill.(7) N15	192††

WIRE (16 gage)	An'ld Stone	Galv. Stone
AlaCity,Ala. R2	17.85	19.40**
Aliq'ppa,Pa. J5	17.85	19.65
Bartonville K4	17.95	19.75
Cleveland A7	17.85	....
Craw'dsville M8	17.95	19.80‡‡
Fostoria,O. S1	18.35	19.90†
Houston S5	18.10	19.65**
Jacksonville M8	17.95	19.80‡‡
Johnstown B2	17.85	19.65§
Kan.City,Mo. S5	18.10	....
Kokomo C16	17.25	18.80†
Minnequa C10	18.10	19.65**
Plim'r,Mass. W12	18.15	19.70†
Pitts.,Calif. C11	18.20	19.75†
S.SanFran. C10	18.20	19.75**
SparrowsPt. B2	17.95	19.75§
Sterling(37) N15	17.25	19.05**
Waukegan A7	17.85	19.40†
Worcester A7	18.15	....

WIRE, Merchant Quality

(6 to 8 gage)	An'ld	Galv.
Ala.City,Ala. R2	9.00	9.55**
Aliquippa J5	8.65	9.25§
Atlanta(48) A11	9.10	9.775§
Bartonville(48) K4	9.10	9.775
Buffalo W12	9.00	9.55†
Cleveland A7	9.00	....
Crawfordsville M8	9.10	9.80‡‡
Donora,Pa. A7	9.00	9.55†
Duluth A7	9.00	9.55†
Fairfield T2	9.00	9.55†
Houston(48) S5	9.25	9.80**
Jack'ville,Fla. M8	9.10	9.80‡‡
Johnstown B2(48)	9.00	9.675§
Joliet,Ill. A7	9.00	9.55†
Kans.City(48) S5	9.25	9.80**
Kokomo(48) C16	9.10	9.65†
LosAngeles B3	9.95	10.625§
Monessen (48) P7	8.65	9.35§
Palmer,Mass. W12	9.30	9.85†
Pitts.,Calif. C11	9.95	10.50†
Rankin,Pa. A7	9.00	9.55†
S.Chicago R2	9.00	9.55**
S.SanFran. C10	9.95	10.50**
Spar'wsPt.(48) B2	9.10	9.775§
Sterling(48) N15	9.25	9.925††
St'ling(1)(48) N15	9.15	9.825††
Struthers,O. Y1	9.00	9.65‡
Worester,Mass. A7	9.30	9.85†

Based on zinc price of: *13.50, †5c, §10c, ‡Less than 10c, ††10.50c, ‡‡11.00c. **Subject to zinc equalization extras.

FASTENERS

(Base discounts, shipments of one to four containers, per cent off list, f.o.b. mill)

BOLTS

Machine Bolts
Full Size Body (cut thread)

½ in. and smaller:	
3 in. and shorter	55.0
3¼ in. thru 6 in.	50.0
Longer than 6 in.	37.0
⅝ in., 3 in. & shorter	47.0
3¼ in. thru 6 in.	40.0
Longer than 6 in.	31.0
⅝ in. thru 1 in.:	
6 in. and shorter	37.0
Longer than 6 in.	31.0
1⅛ in. and larger:	
All lengths	31.0

Undersize Body (rolled thread)

½ in. and smaller:	
3 in. and shorter	55.0
3¼ in. thru 6 in.	50.0

Carriage Bolts
Full Size Body (cut thread) & Undersize Body (rolled thread)

½ in. and smaller:	
6 in. and shorter	48.0
Larger diameters and longer lengths	35.0

Lag, Plow, Tap, Blank, Step, Elevator, Tire, and Fitting Up Bolts

½ in. and smaller:	
6 in. and shorter	48.0
Larger diameters and longer lengths	35.0

High Tensile Structural Bolts (Exc. semifinished hex head bolts, standard heavy double chamfered hex nuts. Bolts — High-carbon steel, heat treated, Spec. ASTM A-325, in bulk. Full keg quantity)

¾ in. diam.	50.0
⅞ in. diam.	47.0
⅞ and 1 in. diam.	43.0
1⅛ and 1¼ in. diam.	34.0

NUTS
(Keg or case quantity and over)

Square Nuts, Reg. & Heavy:

All sizes	56.0

(Full container)

Hex Nuts, Reg. & Heavy
Hot Pressed & Cold Punched:

⅜ in. and smaller	62.0
⅞ in. to 1½ in., incl.	56.0
1⅝ in. and larger	51.5

Hex Nuts, Semifinished, Heavy (Incl. Slotted):

⅜ in. and smaller	62.0
⅞ in. to 1½ in., incl.	56.0
1⅝ in. and larger	51.5

Hex Nuts, Finished (Incl. Slotted and Castellated):

⅜ in. and smaller	65.0
1 in. to 1½ in., incl.	57.0
1⅝ in. and larger	51.5

Semifinished Hex Nuts, Reg. (Incl. Slotted):

⅜ in. and smaller	62.0
¾ in. to ⅞ in., incl.	65.0
1 in. to 1½ in., incl.	57.0
1⅝ in. and larger	51.5

CAP AND SETSCREWS
(Base discounts, packages, per cent off list, f.o.b. mill)

Hex Head Cap Screws, Coarse or Fine Thread, Bright:

6 in. and shorter:	
⅜ in. and smaller	35.0
⅞, ⅞, and 1 in.	16.0
Longer than 6 in.:	
⅜ in. and smaller	3.0
⅞, ⅞, and 1 in.	+11.0

High Carbon, Heat Treated:
6 in. and shorter:

⅜ in. and smaller	20.0
⅞, ⅞, and 1 in.	+ 5.0
Longer than 6 in.:	
⅜ in. and smaller	+19.0
⅞, ⅞, and 1 in.	+39.0

Flat Head Cap Screws:

⅜ in. and smaller, 6 in. and shorter	+85.0

Setscrews, Square Head, Cup Point, Coarse Thread:

Through 1 in. diam.:	
6 in. and shorter	+ 5.0
Longer than 6 in.	+29.0

RIVETS

F.o.b. Cleveland and/or freight equalized with Pittsburgh, f.o.b. Chicago and/or freight equalized with Birmingham except where equalization is too great.

Structural ½ in., larger 12.85
⅞ in. and smaller by 6 in. and shorter: 15.0%

PRESTRESSED STRAND

(High strength, stress relieved; 7 wire uncoated. Net prices per 1000 ft, 40,000 lb and over)

	Strand Diameter, Inches				
	1/4	5/16	3/8	7/16	1/2
Alton,Ill. L1	$32.15	$48.20	$61.55	$81.10	$105.65
Buffalo W12	32.15	48.20	61.55	81.10	105.65
Cleveland A7	32.15	48.20	61.55	81.10	....
KansasCity,Mo. U3	32.15	48.20	61.55	81.10	105.65
Monessen,Pa. P16	32.15	48.20	61.55	81.10	105.65
NewHaven,Conn. A7	32.15	48.20	61.55	81.10	105.65
Pittsburg,Calif. C11	....	48.20	61.55	81.10	....
Pueblo,Colo. W12	32.15	48.20	61.55	81.10	105.65
Roebling,N.J. R5	32.15	48.20	61.55	81.10	105.65
St.Louis L8	32.15	48.20	61.55	81.10	105.65
Waukegan,Ill. A7	32.15	48.20	61.55	81.10	105.65

RAILWAY MATERIALS

Rails	Standard No. 1	Standard No. 2	Tee Rails All No. 2	Tee Rails 60 lb Under
Bessemer,Pa. U5	5.75	5.65	....	6.725
Ensley,Ala. T2	5.75	5.65	....	6.725
Fairfield,Ala. T2	....	....	....	6.725
Gary,Ind. U5	5.75	5.65	....	....
Huntington,W.Va. C15	....	....	....	6.50
Johnstown,Pa. B2	....	....	...(16)	6.725
Lackawanna,N.Y. B2	5.75	5.65	....	6.725
Minnequa,Colo. C10	5.75	5.65	....	7.22
Steelton,Pa. B2	5.75	5.65	....	....
Williamsport,Pa. S19	....	..	....	6.725

TIE PLATES

Fairfield,Ala. T2	6.875
Gary,Ind. U5	6.875
Lackawanna,N.Y. B2	6.875
Minnequa,Colo. C10	7.025
Seattle B3	7.025
Steelton,Pa. B2	6.875
Torrance,Calif. C11	6.875

JOINT BARS

Bessemer,Pa. U5	7.25
Fairfield,Ala. T2	7.25
Joliet,Ill. U5	7.25
Lackawanna,N.Y. B2	7.25
Minnequa,Colo. C10	7.25
Steelton,Pa. B2	7.25

AXLES

Ind.Harbor,Ind. S13	9.125
Johnstown,Pa. B2	9.125

TRACK BOLTS, Untreated

Cleveland R2	15.35
KansasCity,Mo. S5	15.35
Lebanon,Pa. B2	15.35
Minnequa,Colo. C10	15.35
Pittsburgh P14	14.75
Seattle B3	15.85

SCREW SPIKES

Lebanon,Pa. B2	15.10

STANDARD TRACK SPIKES

Fairfield,Ala. T2	9.75
Ind.Harbor,Ind. I-2,Y1	10.10
KansasCity,Mo. S5	10.10
Lebanon,Pa. B2	10.10
Minnequa,Colo. C10	10.10
Pittsburgh J5	10.10
Seattle B3	10.60
S.Chicago,Ill. R2	10.10
Struthers,O. Y1	10.10
Youngstown R2	10.10

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1½ to under 1 7/16 in.; 1 7/16 to under 1 15/16 in., 6.70c; 1 15/16 to 8 in., inclusive, 7.05c.
(6) Chicago or Birm. base.
(7) Chicago base 2 cols. lower.
(8) 16 Ga. and heavier.
(9) Merchant quality; add 0.35c for special quality.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass., base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ⅝" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(21) New Haven, Conn., base.
(22) Deld. San Francisco Bay area.
(23) Special quality.
(24) Deduct 0.05c, finer than 15 Ga.
(25) Bar mill bands.
(26) Deld. in mill zone, 6.285c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c.
(31) Widths over ⅝ in.; 7.875c, for widths ⅝ in. and under by 0.125 in. and thinner.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) Chicago base, 10 points lower.
(38) 14 Ga. & lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld. in mill zone or within switching limits, 5.685c.
(43) 9-14½ Ga.
(44) To fabricators.
(48) 6-7 Ga.
(49) 3½ in. and smaller rounds; 9.65c, over 3½ in. and other shapes.

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	+12.25	+28.75	+5.75	+23.5	+3.25	+21	+1.75	+19.5	+1.75	+19.5	+2	+19.75	0.5	+17.25
Ambridge, Pa. N2	+12.25	....	+5.75	....	+3.25	....	+1.75	....	+1.75	....	+2	....	0.5	....
Lorain, O. N3	+12.25	+28.75	+5.75	+23.5	+3.25	+21	+1.75	+19.5	+1.75	+19.5	+2	+19.75	0.5	+17.25
Youngstown Y1	+12.25	+28.75	+5.75	+23.5	+3.25	+21	+1.75	+19.5	+1.75	+19.5	+2	+19.75	0.5	+17.25

ELECTRICWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2	+12.25	+28.75	+5.75	+23.5	+3.25	+21	+1.75	+19.5	+1.75	+19.5	+2	+19.75	0.5	+17.25

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	....	....	....	....	....	....	2.25	+15	5.25	+11	8.75	+6.5	11.25	+5.25
Alton, Ill. L1	....	....	....	....	....	....	0.25	+17	3.25	+13	6.75	+8.5	9.25	+7.25
Benwood, W. Va. W10	1.5	+27	+10.5	+36	+21	+45.5	2.25	+15	5.25	+11	8.75	+6.5	11.25	+5.25
Butler, Pa. F6	4.5	+24	+8.5	+34	+19.5	+44	....	....	....	....	....	....	....	....
Etna, Pa. N2	....	....	....	....	....	....	2.25	+15	5.25	+11	8.75	+6.5	11.25	+5.25
Fairless, Pa. N3	....	....	....	....	....	....	0.25	+17	3.25	+13	6.75	+8.5	9.25	+7.25
Fontana, Calif. K1	....	....	....	....	....	....	+10.75	+28	+7.75	+24	+4.25	+19.5	+1.75	+18.25
Indiana Harbor, Ind. Y1	....	....	....	....	....	....	1.25	+16	4.25	+12	7.75	+7.5	10.25	+7.75
Lorain, O. N3	....	....	....	....	....	....	2.25	+15	5.25	+11	8.75	+6.5	11.25	+5.25
Sharon, Pa. S4	4.5	+24	+8.5	+34	+19.5	+44	....	....	....	....	....	....	....	....
Sharon, Pa. M6	....	....	....	....	....	....	2.25	+15	5.25	+11	8.75	+6.5	11.25	+5.25
Sparrows Pt., Md. B2	0.5	+28	+11.5	+37	+22	+45.5	0.25	+17	3.25	+13	6.75	+8.5	9.25	+7.25
Wheatland, Pa. W9	4.5	+24	+8.5	+34	+19.5	+44	2.25	+15	5.25	+11	8.75	+6.5	11.25	+5.25
Youngstown R2, Y1	....	....	....	....	....	....	2.25	+15	5.25	+11	8.75	+6.5	11.25	+5.25

Size—Inches	1½		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.72		3.68		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	11.75	+4.25	12.25	+3.75	13.75	+3.5	13.75	+3.5	....	....	....	....
Alton, Ill. L1	9.75	+6.25	10.25	+5.75	11.75	+5.5	11.75	+5.5	1.25	+16.5	1.25	+16.5
Benwood, W. Va. W10	11.75	+4.25	12.25	+3.75	13.75	+3.5	13.75	+3.5	3.25	+14.5	3.25	+14.5
Etna, Pa. N2	11.75	+4.25	12.25	+3.75	13.75	+3.5	13.75	+3.5	3.25	+14.5	3.25	+14.5
Fairless, Pa. N3	9.75	+6.25	10.25	+5.75	11.75	+5.5	11.75	+5.5	1.25	+16.5	1.25	+16.5
Fontana, Calif. K1	+1.25	+17.25	+0.75	+16.75	0.75	+16.5	0.75	+16.5	+9.75	+27.5	+9.75	+27.5
Indiana Harbor, Ind. Y1	10.75	+5.25	11.25	+4.75	12.75	+4.5	12.25	+4.5	2.25	+15.5	2.25	+15.5
Lorain, O. N3	11.75	+4.25	12.25	+3.75	13.75	+3.5	13.75	+3.5	....	....	....	....
Sharon, Pa. M6	11.75	+4.25	12.25	+3.75	13.75	+3.5	13.75	+3.5	....	....	....	....
Sparrows Pt., Md. B2	9.75	+6.25	10.25	+5.75	11.75	+5.5	11.75	+5.5	1.25	+16.5	1.25	+16.5
Wheatland, Pa. W9	11.75	+4.25	12.25	+3.75	13.75	+3.5	13.75	+3.5	3.25	+14.5	3.25	+14.5
Youngstown R2, Y1	11.75	+4.25	12.25	+3.75	13.75	+3.5	13.75	+3.5	3.25	+14.5	3.25	+14.5

*Galvanized pipe discounts based on current price of zinc (11.50c, East St. Louis).

Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

AISI	—Rerolling—		Forging	H.R.	H.R. Rods; C.F.	Bars; Structural			C.R. Strip; Flat
Type	Ingot	Slabs	Billets	Strip	Wire	Shapes	Plates	Sheets	Wire
201	22.00	27.00	....	36.00	40.00	42.00	39.25	48.50	45.00
202	23.75	30.25	36.50	39.00	40.75	43.00	40.00	49.25	48.25
301	23.25	28.00	37.25	37.25	42.00	44.25	41.25	51.25	47.50
302	25.25	31.50	38.00	40.50	42.75	45.00	42.25	52.00	52.00
302B	25.50	32.75	40.75	45.75	45.00	47.25	44.50	57.00	57.00
303	....	32.00	41.00	46.00	45.50	48.00	45.00	56.75	56.75
304	27.00	33.25	40.50	44.25	45.25	47.75	45.75	55.00	55.00
304L	....	....	48.25	51.50	53.00	55.50	53.50	63.25	63.25
305	28.50	36.75	42.50	47.50	45.25	47.75	46.25	58.75	58.75
308	30.75	38.25	47.25	50.25	52.75	55.75	55.25	63.00	63.00
309	39.75	49.50	57.75	64.50	63.75	67.00	66.00	80.50	80.50
310	49.75	61.50	78.00	84.25	86.50	91.00	87.75	96.75	96.75
314	....	....	77.50	....	86.50	91.00	87.75	99.00	104.25
316	39.75	49.50	62.25	69.25	69.25	73.00	71.75	80.75	80.75
316L	....	55.50	70.00	76.50	77.00	80.75	79.50	89.25	89.25
317	48.00	60.00	76.75	88.25	86.25	90.75	88.50	101.00	101.00
321	32.25	40.00	47.00	53.50	52.50	55.50	54.75	65.50	65.50
330	....	....	118.75	....	132.00	138.50	135.50	149.25	149.25
18-8 CbTa	37.00	46.50	55.75	63.50	61.50	64.75	64.75	79.25	79.25
403	....	....	28.25	....	32.00	33.75	30.00	40.25	40.25
405	19.50	25.50	29.75	36.00	33.50	35.25	32.50	46.75	46.75
410	16.75	21.50	28.25	31.00	32.00	33.75	30.00	40.25	40.25
416	....	....	28.75	....	32.50	34.25	31.25	48.25	48.25
420	26.00	33.50	34.25	41.75	39.25	41.25	40.25	62.00	62.00
430	17.00	21.75	28.75	32.00	32.50	34.25	31.00	40.75	40.75
430F	....	....	29.50	....	33.00	34.75	31.75	51.75	51.75
431	....	28.75	37.75	....	42.00	44.25	41.00	56.00	56.00
446	....	....	39.25	59.00	44.25	46.50	42.75	70.00	70.00

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; American Steel & Wire Div., U. S. Steel Corp.; Anchor Drawn Steel Co., division of Vanadium-Alloys Steel Co.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; A. M. Byers Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Carpenter Steel Co. of New England; Charter Wire Products; Crucible Steel Co. of America; Damascus Tube Co.; Dearborn Div., Sharon Steel Corp.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Firth Sterling Inc.; Fort Wayne Metals Inc.; Green River Steel Corp., subsidiary of Jessop Steel Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Ellwood Ivins Steel Tube Works Inc.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Stainless & Strip Div., Jones & Laughlin Steel Corp.; Joslyn Stainless Steels, division of Joslyn Mfg. & Supply Co.; Latrobe Steel Co.; Lukens Steel Co.; Maryland Fine & Specialty Wire Co. Inc.; McLouth Steel Corp.; Metal Forming Corp.; Midvale-Heppenstall Co.; National Standard Co.; National Tube Div., U. S. Steel Corp.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Riverside-Alloy Metal Div., H. K. Porter Company Inc.; Rodney Metals Inc.; Sawhill Tubular Products Inc.; Sharon Steel Corp.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Standard Tube Co.; Superior Steel Div., Copperweld Steel Co.; Superior Tube Co.; Swepco Tube Corp.; Techalloy Co. Inc.; Timken Roller Bearing Co.; Trent Tube Co., subsidiary of Crucible Steel Co. of America; Tube Methods Inc.; Ulbrich Stainless Steel Inc.; U. S. Steel Corp.; Universal Cyclops Steel Corp.; Vanadium-Alloys Steel Co.; Wall Tube & Metal Products Co.; Wallingford Steel Co., subsidiary of Allegheny Ludlum Steel Corp., Washington Steel Corp.

Clad Steel

	Plates, Carbon Base 5%	Plates, Carbon Base 10%	Plates, Carbon Base 15%	Plates, Carbon Base 20%	Sheets, Carbon Base 20%
Stainless					
302	....	....	....	....	37.50
304	26.05	28.80	31.55	34.30	39.75
304L	30.50	33.75	36.95	40.15	....
316	38.20	42.20	46.25	50.25	58.25
316L	42.30	46.75	51.20	55.65	....
316 Cb	49.90	55.15	60.40	65.65	....
321	31.20	34.50	37.75	41.05	47.25
347	36.90	40.80	44.65	48.55	57.00
405	22.25	24.60	26.90	29.25	....
410	20.55	22.70	24.85	27.00	....
430	21.20	23.45	25.65	27.90	....
Inconel	48.90	59.55	70.15	80.85	....
Nickel	41.65	51.95	62.30	72.70	....
Nickel, Low Carbon	41.95	52.60	63.30	74.15	....
Monel	43.35	53.55	63.80	74.05	....

	Strip, Carbon Base —Cold Rolled— 10%	Strip, Carbon Base —Cold Rolled— Both Sides
Copper*	34.75	40.65

*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4, and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Reg. Carbon (W-1)	0.330	W-Cr Hot Work (H-12)	0.530
Spec. Carbon (W-1)	0.385	V-Cr Hot Work (H-13)	0.550
Oil Hardening (O-1)	0.505	W Hot Wk. (H-21)	1.425-1.44
V-Cr Hot Work (H-11)	0.505	Hi-Carbon-Cr (D-11)	0.955

Grade by Analysis (%) W	Cr	V	Co	Mo	AISI Designation	$ per lb
18	4	1	....	...	T-1	1.840
18	4	2	....	...	T-2	2.005
13.5	4	3	....	...	T-3	2.105
18.25	4.25	1	4.75	...	T-4	2.545
18	4	2	9	...	T-5	2.915
20.25	4.25	1.6	12.95	...	T-6	4.330
13.75	3.75	2	5	...	T-8	2.485
1.5	4	1	....	8.5	M-1	1.200
6.4	4.5	1.9	....	5	M-2	1.345
6	4	3	....	6	M-3	1.590

Tool steel producers include: A4, A8, B2, B8, C4, C9, C12, C18, F2, J3, L3, M14, S8, U4, V2, and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate.

	Basic	No. 2 Foundry	Malle-able	Besse-mer
Birmingham District				
Birmingham R2	62.00	62.50••	....	....
Birmingham U6	....	62.50••	66.50	....
Woodward,Ala. W15	62.50•	62.50••	66.50	....
Cincinnati, deld.	....	70.20	....	....
Buffalo District				
Buffalo H1, R2	66.00	66.50	67.00	67.50
N.Tonawanda,N.Y. T9	....	66.50	67.00	67.50
Tonawanda,N.Y. W12	66.00	66.50	67.00	67.50
Boston, deld.	77.29	77.79	78.29	....
Rochester,N.Y., deld.	69.02	69.52	70.02	....
Syracuse,N.Y., deld.	70.12	70.62	71.12	....
Chicago District				
Chicago I-3	66.00	66.50	66.50	67.00
S.Chicago,Ill. R2	66.00	66.50	66.50	67.00
S.Chicago,Ill. W14	66.00	....	66.50	67.00
Milwaukee, deld.	69.02	69.52	69.52	70.02
Muskegon,Mich., deld.	....	74.52	74.52	....
Cleveland District				
Cleveland R2, A7	66.00	66.50	66.50	67.00
Akron,Ohio, deld.	69.52	70.02	70.02	70.52
Mid-Atlantic District				
Birdsboro,Pa. B10	68.00	68.50	69.00	69.50
Chester,Pa. P4	68.00	68.50	69.00	....
Swedeland,Pa. A3	68.00	68.50	69.00	69.50
NewYork, deld.	....	75.50	76.00	....
Newark,N.J., deld.	72.69	73.19	73.69	74.19
Philadelphia, deld.	70.41	70.91	71.41	71.99
Troy,N.Y. R2	68.00	68.50	69.00	69.50
Pittsburgh District				
NevilleIsland,Pa. P6	66.00	66.50	66.50	67.00
Pittsburgh (N&S sides), Aliquippa, deld.	....	67.95	67.95	68.48
McKeesRocks,Pa., deld.	....	67.60	67.60	68.13
Lawrenceville,Homestead, Wilmerding,Monaca,Pa., deld.	....	68.26	68.26	68.79
Verona,Trafford,Pa., deld.	68.29	68.82	68.82	69.35
Brackenridge,Pa., deld.	68.60	69.10	69.10	69.63
Midland,Pa. C18	66.00	....	....	....
Youngstown District				
Hubbard,Ohio Y1	....	....	66.50	....
Sharpsville,Pa. S6	66.00	....	66.50	67.00
Youngstown Y1	....	....	66.50	....
Mansfield,Ohio, deld.	71.30	....	71.80	72.30
Duluth I-3	66.00	66.50	66.50	67.00
Erie,Pa. I-3	66.00	66.50	66.50	67.00
Everett,Mass. E1	67.50	68.00	68.50	....
Fontana,Calif. K1	75.00	75.50	....	....
Geneva,Utah C11	66.00	66.50	....	....
GraniteCity,Ill. G4	67.90	68.40	68.90	....
Ironton,Utah C11	66.00	66.50	....	....
Minnequa,Colo. C10	68.00	68.50	69.00	....
Rockwood,Tenn. T3	....	62.50‡	66.50	....
Toledo,Ohio I-3	66.00	66.50	66.50	67.00
Cincinnati, deld.	72.94	73.44	....	....

•Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.
••Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.50.
‡Phos. 0.50% up; Phos. 0.30-0.49, $63.50.

PIG IRON DIFFERENTIALS

Silicon: Add 75 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos. iron on which base is 1.75-2.00%.

Manganese: Add 50 cents per ton for each 0.25% manganese over 1% or portion thereof.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1 for each 0.50% silicon or portion thereof over the base grade within a range of 6.50 to 11.50%; starting with silicon over 11.50% and $1.50 per ton for each 0.50% silicon or portion thereof up to 14%; add $1 for each 0.50% Mn over 1%)

Jackson,Ohio I-3, J1	$78.00
Buffalo H1	79.25

ELECTRIC FURNACE SILVERY IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1.25 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.045% max P)

CalvertCity,Ky. P15	$99.00
NiagaraFalls,N.Y. P15	99.00
Keokuk,Iowa Open-hearth & Fdry. $9 freight allowed K2	103.50
Keokuk,Iowa O.H. & Fdry. 12½ lb piglets, 16% Si, max fr'gt allowed up to $9, K2	106.50

LOW PHOSPHORUS PIG IRON, Gross Ton

Lyles,Tenn. T3 (Phos. 0.035% max)	$73.00
Rockwood,Tenn. T3 (Phos. 0.035% max)	73.00
Troy,N.Y. R2 (Phos. 0.035% max)	73.00
Philadelphia, deld.	81.67
Cleveland A7 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Duluth I-3 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Erie,Pa. I-3 (Intermediate) (Phos. 0.036-0.075% max)	71.00
NevilleIsland,Pa. P6 (Intermediate) (Phos. 0.036-0.075% max)	71.00

Steel Service Center Products

Representative prices, per pound, subject to extras, f.o.b. warehouse. City delivery charges are 15 cents per 100 lb except: Denver, Moline, Norfolk, Richmond, Washington, 20 cents; Baltimore, Boston, Los Angeles, New York, Philadelphia, Portland, Spokane, San Francisco, 10 cents; Atlanta, Birmingham, Chattanooga, Houston, Seattle, no charge.

	SHEETS				STRIP	BARS			Standard Structural Shapes	PLATES	
	Hot-Rolled	Cold-Rolled	Galv. 10 Ga.†	Stainless Type 302	Hot-Rolled*	H.R. Rounds	C.F. Rds.‡	H.R. Alloy 4140††[5]		Carbon	Floor
Atlanta	8.59§	9.86§	10.13	....	8.91	9.39	13.24 #	....	9.40	9.29	11.21
Baltimore	8.55	9.25	9 99	....	9.05	9.45	11.85 #	15.48	9.55	9.00	10.50
Birmingham	8.18	9.45	10.46	....	8.51	8.99	....	....	9.00	8.89	10.99
Boston	9.31	10.40	11 39	53 50	9.73	10.11	13.39 #	15.71	10.01	10.02	11.85
Buffalo	8.40	9.60	10.85	55.98	8.75	9.15	11.45 #	15.40	9.25	9.20	10.75
Chattanooga	8.35	9.69	9.65	....	8.40	8.77	10.46	....	8.88	8.80	10.66
Chicago	8.25	9.45	10.50	53.00	8.51	8.99	9.15	15.05	9.00	8.89	10.20
Cincinnati	8.43	9.51	10.55	53.43	8.83	9.31	11.53 #	15.37	9.56	9.27	10.53
Cleveland	8.36	9.54	10.65	52.33	8.63	9.10	11.25 #	15.16	9.39	9.13	10.44
Dallas	8.80	9.30	....	....	8.85	8.80	....	....	8.75	9.15	10.40
Denver	9.40	11.84	12.94	....	9.43	9.80	11.19	....	9.84	9.76	11.08
Detroit	8.51	9.71	10.87	56.50	8.88	9.30	9.51	15.33	9.56	9.26	10.46
Erie, Pa.	8.20	9.45	9.95[10]	....	8.60	9.10	11.25	....	9.35	9.10	10.60
Houston	8.40	8.90	10.29	52.00	8.45	8.40	11.60	15.75	8.35	8.75	10.10
Jackson, Miss.	8.52	9.79	....	....	8.84	9.82	10.68	....	9.33	9.22	11.03
Los Angeles	8.70[2]	10.80[2]	12.15[3]	57.60	9.15	9.10[3]	12.95[3]	16.35	9.00[3]	9.10[3]	11.30[3]
Memphis, Tenn.	8.59	9.80	....	....	8.84	9.32	11.25 #	....	9.33	9.22	10.86
Milwaukee	8.39	9.59	10.64	....	8.65	9.13	9.39	15.19	9.22	9.03	10.34
Moline, Ill.	8.55	9.80	....	....	8.84	8.95	9.15	....	8.99	8.91	....
New York	8.87	10.13	11.10	53.08	9.64	9.99	13.25 #	15.50	9.74	9.77	11.06
Norfolk, Va.	8.40	....	....	....	9.10	9.10	12.00	....	9.40	8.85	10.35
Philadelphia	8.20	9.25	11.34	52.71	9.25	9.40	11.95 #	15.48	9.10	9.15	10.40••
Pittsburgh	8.35	9.55	10.90	52.00	8.61	8.99	11.25 #	15.05	9.00	8.89	10.20
Richmond, Va.	8.40	....	10.40	....	9.10	9.00	....	....	9.40	8.85	10.35
St. Louis	8.63	9.83	10.88	....	8.89	9.37	9.78	15.43	9.48	9.27	10.58
St. Paul	8.79	10.04	11.09	....	8.84	9.21	9.86	....	9.38	9.30	10.49
San Francisco	9.65	11.10	11.00	55.10	9.75	10.15	13.00	16.00	9.85	10.00	12.35
Seattle	9.95	11.52[3]	12.15[3]	55.02	10.00	10.10	14.70	16.80[3]	9.80	9.70	12.10
South'ton, Conn.	9.07	10.33	10.71	....	9.48	9.74	....	....	9.57	9.57	10.91
Spokane	9.95	11.55	12.50	57.38	10.55	10.65	14.70	16.80	9.80	9.70	12.10
Washington	9.15	....	....	....	9.65	10.05	12.50	....	10.15	9.60	11.10

•Prices do not include gage extras; †prices include gage and coating extras; ‡includes 35-cent bar quality extras; §42 in. and under; ••½ in. and heavier; ††as annealed; ‡‡¾ in. to 4 in. wide inclusive; #net price, 1 in. round C-1018.

Base quantities, 2000 to 4999 lb except as noted; cold-finished bars, 2000 lb and over except in Seattle, 2000 to 3999 lb; stainless sheets, 8000 lb except in Chicago, New York, Boston, Seattle, 10,000 lb and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb, except in Seattle, 30,000 lb and over; [2]—30,000 lb; [3]—1000 to 4999 lb; [5]—1000 to 1999 lb; [10]—2000 lb and over.

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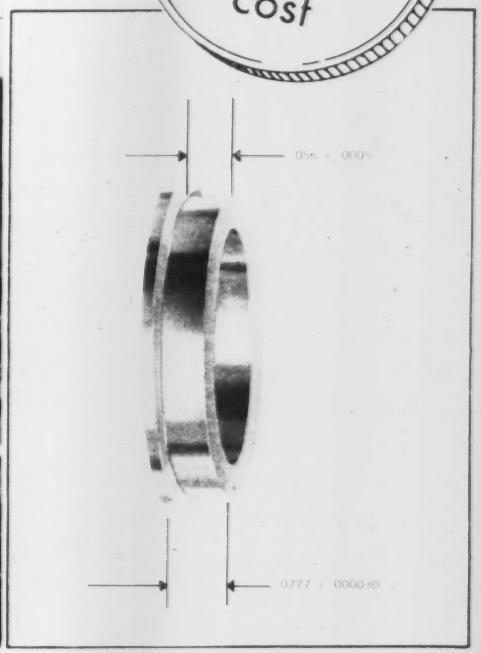
Norton No. 12 HYPROLAP* Machine

boosts production rate 1100% per hour . . .

saves time... reduces cost



In the Plymouth Division of the Burroughs Corporation at Plymouth, Michigan production men recognized the productive possibilities of this NORTON 12 HYPROLAP High Production Lapping Machine and now use it to finish spacer collars at over 11 times the speed of the two surface grinders previously used. Rotating carriers bring the collar between the upper and lower laps. Work pieces are automatically fed and ejected. Besides hitting a new high in production, Burroughs also has eliminated the grading and selecting of finished pieces through the extreme productive accuracy of this advanced NORTON lapping machine.

On the 12 HYPROLAP machine the upper lap refines the surface quality of the hub face of the spacer collar, holding the .056" dimension. The lower lap finishes the flange face, producing the .0777" thickness dimension within ±.000030" instead of ±.0001" as in the former method.

As proved in the Burroughs plant, the No. 12 HYPROLAP high production lapping machine offers many advantages over conventional finishing methods. Equipped with bonded abrasive laps, this parallel face flat lapping machine is available with automatic or semiautomatic continuous feed. Both arrangements provide fast lapping . . . continual operation with only occasional lap dressing . . . a wide range of selective speeds for laps and work holders . . . finished work washed clean, eliminating extra cleaning operations.

For further details on how this combination of speed and accuracy can improve your own finishing operations, see your Norton Representative or write us direct for Catalog No. 2359-1. And remember: only Norton offers you such long experience in both grinding machines and grinding wheels to bring you the "Touch of Gold" that helps you produce more at lower cost. NORTON COMPANY, Machine Division, Worcester 6, Massachusetts.

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Refractories

Fire Clay Brick (per 1000)

High-Heat Duty: Ashland, Grahn, Hayward, Hitchens, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Winburne, Snow Shoe, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parrall, Portsmouth, Ohio, Ottawa, Ill., Stevens Pottery, Ga., $140; Salina, Pa., $145; Niles, Ohio, $138; Cutler, Utah, $165.

Super-Duty: Ironton, Ohio, Vandalia, Mo., Olive Hill, Ky., Clearfield, Salina, Winburne, Snow Shoe, Pa., New Savage, Md., St. Louis, $185; Stevens Pottery, Ga., $195; Cutler, Utah, $233.

Silica Brick (per 1000)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Pt. Matilda, Pa., Portsmouth, Ohio, Hawstone, Pa., $158; Warren, Niles, Windham, Ohio, Hays, Latrobe, Morrisville, Pa., $163; E. Chicago, Ind., Joliet, Rockdale, Ill., $168; Lehigh, Utah, $175; Los Angeles, $180.

Super-Duty: Sproul, Hawstone, Pa., Niles, Warren, Windham, Ohio, Leslie, Md., Athens, Tex., $157; Morrisville, Hays, Latrobe, Pa., $168; E. Chicago, Ind., $167; Curtner, Calif., $182.

Semisilica Brick (per 1000)

Clearfield, Pa., $140; Philadelphia, $137; Woodbridge, N. J., $135.

Ladle Brick (per 1000)

Dry Pressed: Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Vanport, Pa., Mexico, Vandalia, Mo., Wellsville, Irondale, New Salisbury, Ohio, $96.75; Clearfield, Pa., Portsmouth, Ohio, $102.

High-Alumina Brick (per 1000)

50 Per Cent: St. Louis, Mexico, Vandalia, Mo., $235; Danville, Ill., $253; Philadelphia, Clearfield, Pa., $230; Orviston, Snow Shoe, Pa., $260.

60 Per Cent: St. Louis, Mexico, Vandalia, Mo., $295; Danville, Ill., $313; Clearfield, Orviston, Snow Shoe, Pa., $320; Philadelphia, $310.

70 Per Cent: St. Louis, Mexico, Vandalia, Mo., $335; Danville, Ill., $353; Clearfield, Orviston, Snow Shoe, Pa., $360; Philadelphia, $350.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., St. Louis, $188.

Nozzles (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., St. Louis, $310.

Runners (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., $234.

Dolomite (per net ton)

Domestic, dead-burned, bulk, Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Woodville, Gibsonburg, Narlo, Ohio, $16.75; Thornton, McCook, Ill., $17; Dolly Siding, Bonne Terre, Mo., $15.60.

Magnesite (per net ton)

Domestic, dead-burned, ½ in. grains with fines: Chewelah, Wash., Luning, Nev., $46; ⅜ in. grains with fines: Baltimore, $73.

Fluorspar

Metallurgical grades, f.o.b. shipping point in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $37-$41; 70%, $36-$40; 60%, $33-$36.50. Imported, net ton, f.o.b. cars point of entry, duty paid, metallurgical grade: European, $30-$33, contract; Mexican, all rail, duty paid, $25; barge, Brownsville, Tex., $27.

Ores

Lake Superior Iron Ore

(Prices effective for the 1958 shipping season, gross ton, 51.50% iron natural, rail of vessel, lower lake ports.)

Mesabi bessemer	$11.60
Mesabi nonbessemer	11.45
Old Range bessemer	11.85
Old Range nonbessemer	11.70
Open-hearth lump	12.70
High phos	11.45

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon, which were in effect Jan. 30, 1957, and increases or decreases after that date are absorbed by the seller.

Eastern Local Iron Ore

Cents per unit, deld. E. Pa.

New Jersey, foundry and basic 62-64% concentrates	18.00-19.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 65%	23.00
N. African hematite (spot)	nom
Brazilian iron ore, 68.5%	26.00

Tungsten Ore

Net ton unit

Foreign ollframite, good commerical quality	$11.20-$11.25*
Domestic, concentrates f.o.b. milling points	16.00-17.00†

*Before duty; †Nominal.

Manganese Ore

Mn 46-48%, Indian (export tax included) $1.10 per long ton unit, c.i.f. U. S. ports, duty for buyer's account; other than Indian, nominal; contracts by negotiation.

Chrome Ore

Gross ton, f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.

Indian and Rhodesian	
48% 3:1	$42.00-44.00
48% 2.8:1	38.00-40.00
48% no ratio	29.00-31.00
South African Transvaal	
44% no ratio	22.00-23.00
48% no ratio	29.00-31.00
Turkish	
48% 3:1	51.00-55.00
Domestic	
Rail nearest seller	
48% 3:1	39.00

Molybdenum

Sulfide concentrate, per lb of Mo content, mines, unpacked	$1.23

Antimony Ore

Per short ton unit of Sb content, c.i.f. seaboard

50-55%	$2.25-2.40
60-65%	2.50-3.10

Vanadium Ore

Cents per lb V_2O_5

Domestic	31.00

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, Pa., furnace	$14.75-15.75
Connellsville, Pa., foundry	18.00-18.50

Oven Foundry Coke

Birmingham, ovens	$28.85
Cincinnati, deld.	31.84
Buffalo, ovens	30.50
Camden, N. J., ovens	29.50
Detroit, ovens	30.50
Pontiac, Mich., deld.	32.45
Saginaw, Mich., deld.	34.03
Erie, Pa., ovens	30.50
Everett, Mass., ovens;	
New England, deld.	31.55*
Indianapolis, ovens	29.75
Ironton, Ohio, ovens	29.00
Cincinnati, deld.	31.84
Kearny, N. J., ovens	29.75
Milwaukee, ovens	30.50
Neville Island (Pittsburgh), Pa., ovens	29.25
Painesville, Ohio, ovens	30.50
Cleveland, deld.	32.69
Philadelphia, ovens	29.50
St. Louis, ovens	31.50
St. Paul, ovens	29.75
Chicago, deld.	33.18
Swedeland, Pa., ovens	29.50
Terre Haute, Ind., ovens	29.75

*Or within $5.15 freight zone from works.

Coal Chemicals

Spot, cents per gallon, ovens

Pure benzene	31.00‡
Toluene, one deg. (deld.)	25.00*
Industrial xylene	29.00§

Per ton, bulk, ovens

Ammonium sulfate	$32.00-35.00†

Cents per pound, producing point

Phenol**: Grade 1, 16.50; Grade 2-3, 15.00; Grade 4, 17.00; Grade 5, 16.50; Grade 6, 14.25.

Effective: *Apr. 12; †July 1; ‡July 8; §Aug.; **Nov. 4.

Metal Powder

(Per pound f.o.b. shipping point in ton lots for minus 100 mesh, except as noted)

	Cents
Sponge Iron, Swedish: deld. east of Mississippi River, ocean bags 23,000 lb and over; 10.50 F.o.b. Riverton or Camden, N. J., west of Mississippi River	9.50
Sponge Iron, Domestic, 99 + % Fe: Deld. east of Mississippi River, 23,000 lb and over	10.50
Electrolytic Iron, Melting stock, 99.87% Fe, irregular fragments of ¼ in. x 1.3 in.	28.75
(In contract lots of 240 tons price is 22.75c)	
Annealed, 99.5% Fe	36.50
Unannealed (99 + % Fe)	36.00
Unannealed (99 + % Fe) (minus 325 mesh)	59.00
Powder Flakes (minus 16, plus 100 mesh)	29.00
Carbonyl Iron: 98.1-99.9%, 3 to 20 microns, depending on grade, 93.00-290.00 in standard 200-lb containers; all minus 200 mesh	
Aluminum: Atomized, 500-lb drum, freight allowed	
Carlots	38.50
Ton lots	40.50
Antimony, 500-lb lots	42.00*
Brass, 5000-lb lots	33.00-48.90†
Bronze, 5000-lb lots	49.60-53.70†
Copper:	
Electrolytic	14.25*
Reduced	14.25*
Lead	7.50*
Manganese:	
Minus 35 mesh	64.00
Minus 100 mesh	70.00
Minus 200 mesh	75.00
Nickel, unannealed	74.00
Nickel-Silver, 5000-lb lots	50.99-55.40†
Phosphor-Copper, 5000-lb lots	61.80
Copper (atomized) 5000-lb lots	42.30-50.80†
Silicon	47.50
Solder	7.00*
Stainless Steel, 304	$1.07
Stainless Steel, 316	$1.26
Tin	14.00*
Zinc, 5000-lb lots	19.00-32.20†
Tungsten:	Dollars
Melting grade, 99% 60 to 200 mesh, nominal:	
1000 lb and over	3.15
Less than 1000 lb	3.30
Chromium, electrolytic 99.8% Cr, min metallic basis	5.00

*Plus cost of metal. †Depending on composition. ‡Depending on mesh.

Electrodes

Threaded with nipple; unboxed, f.o.b. plant

GRAPHITE

Inches Diam	Inches Length	Per 100 lb
2	24	$64.00
2½	30	41.50
3	40	39.25
4	40	37.00
5	40	36.50
6	60	33.25
7	60	29.75
8, 9, 10	60	29.50
12	72	28.25
14	60	28.25
16	72	27.25
17	60	27.25
18	72	27.00
20	72	26.50
24	84	27.25

CARBON

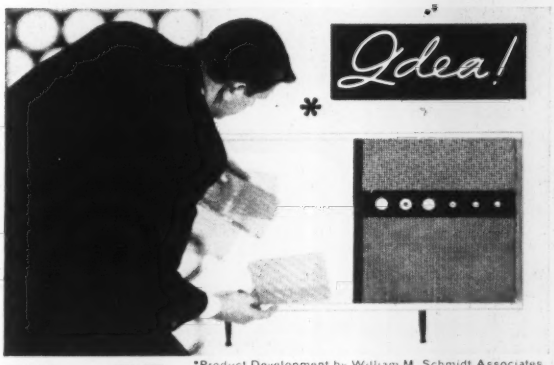
8	60	14.25
10	60	13.80
12	60	14.75
14	60	14.75
14	72	12.55
17	60	12.65
17	72	12.10
20	60	11.55
24	72, 84	11.95
24	96	12.10
30	84	12.00
35, 40	110	11.60
40	160	12.50

Imported Steel

(Base per 100 lb, landed, duty paid, based on current ocean rates. Any increase in these rates is for buyer's account. Source of shipment: Western continental European countries.)

	North Atlantic	South Atlantic	Gulf Coast	West Coast
Deformed Bars, Intermediate, ASTM-A 305	$5.10	$5.10	$5.00	$5.45
Bar Size Angles	5.00	5.00	4.90	5.33
Structural Angles	5.00	5.00	4.90	5.33
I-Beams	5.06	5.06	4.96	5.40
Channels	5.06	5.06	4.96	5.40
Plates (basic bessemer)	6.62	6.62	6.62	6.94
Sheets, H.R.	8.20	8.20	8.20	8.50
Sheets, C.R. (drawing quality)	8.75	8.75	8.75	9.12
Furring Channels, C.R., 1000 ft, ¾ x 0.30 lb per ft	25.71	25.59	25.59	26.46
Barbed Wire (‡)	6.65	6.65	6.65	7.00
Merchant Bars	5.40	5.40	5.35	5.90
Hot-Rolled Bands	7.15	7.15	7.15	7.55
Wire Rods, Thomas Commercial No. 5	5.15	5.28	5.10	5.45
Wire Rods, O.H. Cold Heading Quality No. 5	6.05	6.18	6.00	6.30
Bright Common Wire Nails (§)	7.89	7.75	7.67	8.26

†Per 82 lb net reel. §Per 100-lb kegs, 20d nails and heavier.



*Product Development by William M. Schmidt Associates

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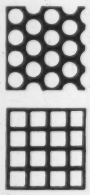

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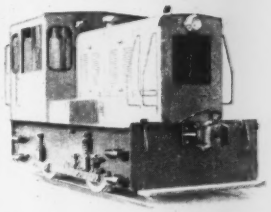

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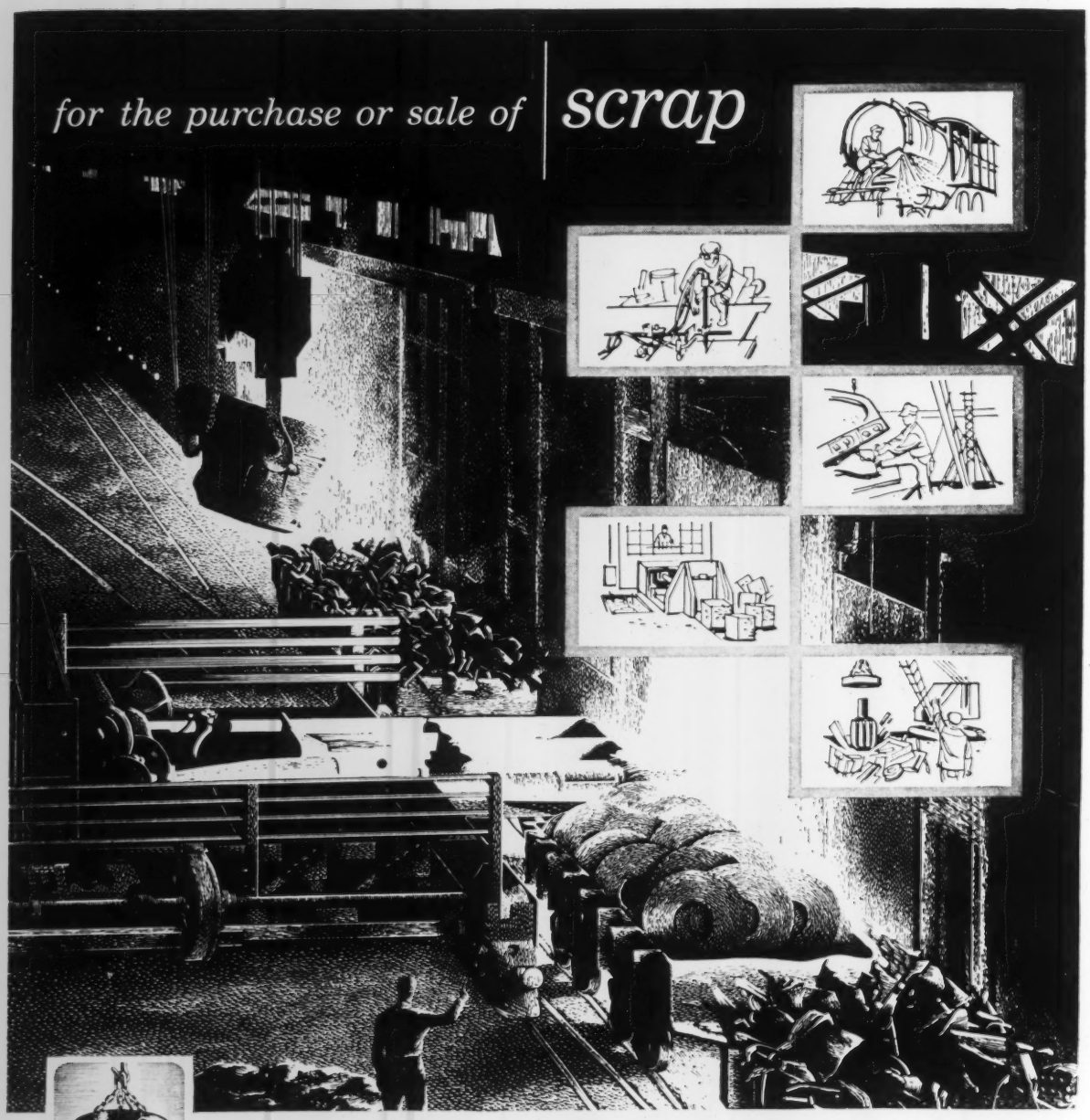

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Scrap Price Decline Is Unchecked

STEEL's composite on the prime grade slips another 66 cents a ton to $39.67. Consumer buying support still lacking as the holiday season nears

Scrap Prices, Page 166

Pittsburgh—Brokers paid $44.50-$44.75 for factory bundles from Fisher Body Div., General Motors Corp. A month ago, they bid $49. Dealers sold No. 1 heavy melting scrap for $41.50 and had to absorb freight to a mill on the edge of the district. They sold No. 2 heavy melting for $34 delivered and No. 2 bundles for $29. Brokers think the railroad lists will be off $2 or $3 a ton this month.

Philadelphia—Prices are off $1 a ton on No. 1 heavy melting at $35, No. 2 heavy melting at $32, No. 1 cupola cast at $40, and heavy breakable cast at $41. No. 2 bundles are quoted down 50 cents a ton. Demand is slow for all major grades. Mill inventories are substantial.

New York — Reflecting extreme dullness, brokers have reduced their buying prices on most grades of steel scrap, including borings and turnings, $1 a ton. Prices on low phos structurals and plates were dropped $2. The cast iron grades were cut $1.

Cleveland—The market is weaker, though absence of representative sales makes it difficult to determine the exact level of prices. Brokers think pending closings on railroad lists may provide a better idea of the market level by weekend. Scrap generation is up. The approaching holidays are a check on buying.

Youngstown—Sales of some No. 1 heavy melting industrial scrap to a local steel mill at $44, or $3 under a previous private sale to the same steelmaker, were reported last week. Scrapmen look for No. 1 heavy melting dealer scrap to move at $42-$43.

Detroit—Local auto scrap lists closed $3 to $4 a ton lower than month-ago figures. Some November consignments still haven't been delivered to mills, and local dealers figure there will be little action until this scrap moves. The holdup has the effect of keeping Detroit area prices depressed. Estimates are that No. 1 bundles will sink to $29-$30 by the end of this month.

Buffalo — The market appears easier as dealers await orders for December delivery. Supplies are adequate for current demand. Mills and foundries are ordering cautiously. They hold comfortable inventories. There's little out-district interest in Buffalo area scrap at present.

Chicago—Slightly higher prices have been paid for a few grades, but the change is explained by such factors as quality, rather than a firming up of the market. A leading mill reaffirmed $45 a ton as its buying price for No. 1 industrial heavy melting steel for December delivery, the third straight month the price has held.

A tremendous amount of scrap is being generated by metalworking plants, and it has no place to go in the current dull market. Another negative influence: Seven steel mill blast furnaces are still idle, and they can be blown in as metallics are needed to support increased steelmaking.

Cincinnati—An area mill entered the market last week, offering $2 to $3 a ton less on the principal steelmaking grades. Result: Brokers lowered their buying price on No. 1 heavy melting $2 a ton to $35.50-$36.50.

St. Louis — The cold spell has slowed collections, but the situation has not been reflected in prices to any noticeable extent. The only fluctuations the last week were in railroad material, and they were minor. No. 1 heavy melting, random length rails, and rerolling rails dropped 50 cents a ton.

Birmingham—Sales are expected to pick up this month. Some consumers indicate they will enter the market for enough tonnage to fill their December needs, but they do not plan to add to their inventories until after the turn of the year. Brokers have trimmed their quotations in anticipation of lower offers from consumers. Lacking a thorough test, prices are nominal.

Houston—Lacking a representative buying test, prices are nominal. Some material is backing up in yards as major consumers continue out of the market. No representative mill buying is expected until next month.

San Francisco — Things change quickly sometimes, Pacific Coast scrapmen learned last week. A Japanese trade mission representative said two weeks ago his country

(Please turn to Page 172)

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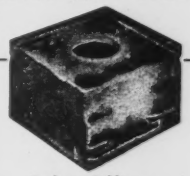

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Iron and Steel Scrap

Consumer prices per gross ton, except as otherwise noted, including brokers' commission, as reported to STEEL, Dec. 3, 1958. *Changes shown in italics.*

STEELMAKING SCRAP COMPOSITE

Dec. 3	$39.67
Nov. 26	40.33
Nov. Avg.	41.42
Dec. 1957	32.77
Dec. 1953	36.69

Based on No. 1 heavy melting grade at Pittsburgh, Chicago, and eastern Pennsylvania.

PITTSBURGH

No. 1 heavy melting	*41.00-42.00*
No. 2 heavy melting	33.00-34.00
No. 1 dealer bundles	*41.00-42.00*
No. 2 bundles	*29.00-30.00*
No. 1 busheling	*41.00-42.00*
No. 1 factory bundles	*46.00-47.00*
Machine shop turnings	*20.00-21.00*
Mixed borings, turnings	*20.00-21.00*
Short shovel turnings	25.00-26.00
Cast iron borings	25.00-26.00
Cut structurals:	
2 ft and under	*48.00-49.00*
3 ft lengths	*47.00-48.00*
Heavy turnings	34.00-35.00
Punchings & plate scrap	*48.00-49.00*
Electric furnace bundles	*48.00-49.00*

Cast Iron Grades

No. 1 cupola	44.00-45.00
Stove plate	41.00-42.00
Unstripped motor blocks	31.00-32.00
Clean auto cast	39.00-40.00
Drop broken machinery	51.00-52.00

Railroad Scrap

No. 1 R.R. heavy melt.	*45.00-46.00*
Rails, 2 ft and under	57.00-58.00
Rails, 18 in. and under	58.00-59.00
Random rails	54.00-55.00
Railroad specialties	*51.00-52.00*
Angles, splice bars	*51.00-52.00*
Rails, rerolling	60.00-61.00

Stainless Steel Scrap

18-8 bundles & solids	225.00-230.00
18-8 turnings	125.00-130.00
430 bundles & solids	125.00-130.00
430 turnings	55.00-65.00

CHICAGO

No. 1 hvy. melt, indus	*44.00-45.00*
No. 1 heavy melt. dealer	40.00-41.00
No. 2 heavy melting	*36.00-37.00*
No. 1 factory bundles	47.00-48.00
No. 1 dealer bundles	42.00-43.00
No. 2 bundles	29.00-30.00
No. 1 busheling, indus.	*44.00-45.00*
No. 1 busheling, dealer	40.00-41.00
Machine shop turnings	22.00-23.00
Mixed borings, turnings	24.00-25.00
Short shovel turnings	24.00-25.00
Cast iron borings	24.00-25.00
Cut structurals, 3 ft	46.00-47.00
Punchings & plate scrap	47.00-48.00

Cast Iron Grades

No. 1 cupola	45.00-46.00
Stove plate	43.00-44.00
Unstripped motor blocks	37.00-38.00
Clean auto cast	*52.00-53.00*
Drop broken machinery	*52.00-53.00*

Railroad Scrap

No. 1 R.R. heavy melt.	46.00-47.00
R.R. malleable	55.00-56.00
Rails, 2 ft and under	58.00-59.00
Rails, 18 in. and under	59.00-60.00
Angles, splice bars	54.00-55.00
Axles	*69.00-70.00*
Rails, rerolling	*63.00-64.00*

Stainless Steel Scrap

18-8 bundles & solids	215.00-220.00
18-8 turnings	115.00-120.00
430 bundles & solids	115.00-120.00
430 turnings	55.00-60.00

YOUNGSTOWN

No. 1 heavy melting	42.00-43.00
No. 2 heavy melting	29.00-30.00
No. 1 busheling	42.00-43.00
No. 1 bundles	42.00-43.00
No. 2 bundles	29.00-30.00
Machine shop turnings	15.00-16.00
Short shovel turnings	20.00-21.00
Cast iron borings	20.00-21.00
Low phos.	*43.00-44.00*
Electric furnace bundles	*43.00-44.00*

Railroad Scrap

No. R.R. heavy melt.	44.00-45.00

CLEVELAND

No. 1 heavy melting	38.50-39.50
No. 2 heavy melting	25.00-26.00
No. 1 factory bundles	43.00-44.00
No. 1 bundles	38.50-39.50
No. 2 bundles	28.50-29.50
No. 1 busheling	38.50-39.50
Machine shop turnings	14.00-15.00
Short shovel turnings	20.00-21.00
Mixed borings, turnings	20.00-21.00
Cast iron borings	20.00-21.00
Cut foundry steel	40.00-41.00
Cut structurals, plates 2 ft and under	47.00-48.00
Low phos, punching & plate	40.00-41.00
Alloy free, short shovel turnings	22.00-23.00
Electric furnace bundles	*39.00-40.00*

Cast Iron Grades

No. 1 cupola	44.00-45.00
Charging box cast	37.00-38.00
Heavy breakable cast	36.00-37.00
Stove plate	43.00-44.00
Unstripped motor blocks	32.00-33.00
Brake shoes	36.00-37.00
Clean auto cast	49.00-50.00
Burnt cast	33.00-34.00
Drop broken machinery	49.00-50.00

Railroad Scrap

R.R. malleable	63.00-64.00
Rails, 2 ft and under	57.00-58.00
Rails, 18 in. and under	58.00-59.00
Rails, random lengths	52.00-53.00
Cast steel	49.00-50.00
Railroad specialties	50.00-51.00
Uncut tires	43.00-44.00
Angles, splice bars	50.00-51.00
Rails, rerolling	56.00-57.00

Stainless Steel
(Brokers' buying prices; f.o.b. shipping point)

18-8 bundles, solids	205.00-215.00
18-8 turnings	115.00-120.00
430 clips, bundles, solids	110.00-120.00
430 turnings	40.00-50.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	38.00
No. 2 heavy melting	36.00
No. 1 bundles	40.00
No. 2 bundles	29.00
No. 1 busheling	40.00
Machine shop turnings	20.00†
Short shovel turnings	22.00†

Cast Iron Grades

No. 1 cupola	49.00
Charging box cast	40.00
Heavy breakable cast	38.00
Unstripped motor blocks	39.00
Clean auto cast	49.00
Stove plate	46.00

Railroad Scrap

No. 1 R.R. heavy melt.	*44.00*
Rails, 18 in. and under	52.00†
Rails, random lengths	*47.50*
Rails, rerolling	*59.50*
Angles, splice bars	48.00

BIRMINGHAM

No. 1 heavy melting	*35.00-36.00*
No. 2 heavy melting	*28.00-29.00*
No. 1 bundles	*35.00-36.00*
No. 2 bundles	21.00-22.00
No. 1 busheling	*35.00-36.00*
Cast iron borings	13.00-14.00
Machine shop turnings	*23.00-24.00*
Short shovel turnings	*24.00-25.00*
Bars, crops and plates	*43.00-44.00*
Structurals & plates	*42.00-43.00*
Electric furnace bundles	*39.00-40.00*
Electric furnace:	
2 ft and under	*37.00-38.00*
3 ft and under	*36.00-37.00*

Cast Iron Grades

No. 1 cupola	54.00-55.00
Stove plate	53.00-54.00
Unstripped motor blocks	*41.00-42.00*
Charging box cast	29.00-30.00
No. 1 wheels	42.00-43.00

Railroad Scrap

No. 1 R.R. heavy melt.	*37.00-39.00*
Rails, 18 in. and under	*49.00-50.00*
Rails, rerolling	*54.00-55.00*
Rails, random lengths	*44.00-45.00*
Angles, splice bars	*45.00-46.00*

PHILADELPHIA

No. 1 heavy melting	*35.00*
No. 2 heavy melting	*32.00*
No. 1 bundles	36.00
No. 2 bundles	*22.50*
No. 1 busheling	*35.00*
Electric furnace bundles	37.00
Mixed borings, turnings	20.00-21.00†
Short shovel turnings	23.00-24.00†
Machine shop turnings	19.00-20.00†
Heavy turnings	33.00
Structurals & plate	39.00-40.00
Couplers, springs, wheels	42.00-43.00
Rails, crops, 2 ft & under	57.00-58.00

Cast Iron Grades

No. 1 cupola	*40.00*
Heavy breakable cast	*41.00*
Malleable	58.00
Drop broken machinery	48.00-49.00

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	*27.00-28.00*
No. 2 heavy melting	*24.00-25.00*
No. 1 bundles	*27.00-28.00*
No. 2 bundles	*18.00-19.00*
Machine shop turnings	*9.00-10.00*
Mixed borings, turnings	*10.00-11.00*
Short shovel turnings	*13.00-14.00*
Low phos. (structurals & plates)	*33.00-34.00*

Cast Iron Grades

No. 1 cupola	*35.00-36.00*
Unstripped motor blocks	*28.00-29.00*
Heavy breakable	*32.00-33.00*

Stainless Steel

18-8 sheets, clips solids	185.00-190.00
18-8 borings, turnings	85.00-90.00
410 sheets clips, solids	55.00-60.00
430 sheets, clips, solids	75.00-80.00

BUFFALO

No. 1 heavy melting	*33.00-34.00*
No. 2 heavy melting	*27.00-28.00*
No. 1 bundles	*33.00-34.00*
No. 2 bundles	*25.00-26.00*
No. 1 busheling	*33.00-34.00*
Mixed borings, turnings	17.00-18.00
Machine shop turnings	15.00-16.00
Short shovel turnings	19.00-20.00
Cast iron borings	17.00-18.00
Low phos. structurals and plate, 2 ft and under	*42.00-43.00*

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	44.00-45.00
No. 1 machinery	48.00-49.00

Railroad Scrap

Rails, random lengths	*47.00-48.00*
Rails, 3 ft and under	*53.00-54.00*
Railroad specialties	*42.00-43.00*

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*35.50-36.50*
No. 2 heavy melting	*30.50-31.50*
No. 1 bundles	*35.50-36.50*
No. 2 bundles	*24.00-25.00*
No. 1 busheling	*35.50-36.50*
Machine shop turnings	*17.00-18.00*
Mixed borings, turnings	*18.00-19.00*
Short shovel turnings	*20.00-21.00*
Cast iron borings	*18.00-19.00*
Low phos., 18 in.	45.00-46.00

Cast Iron Grades

No. 1 cupola	45.00-46.00
Heavy breakable cast	38.00-39.00
Charging box cast	36.00-37.00
Drop broken machinery	47.00-48.00

Railroad Scrap

No. 1 R.R. heavy melt.	44.00-45.00
Rails, 18 in. and under	55.00-56.00
Rails, random lengths	49.00-50.00

HOUSTON

(Brokers' buying prices; f.o.b. cars)

No. 1 heavy melting	40.00†
No. 2 heavy melting	34.00†
No. 1 bundles	40.00†
No. 2 bundles	25.00†
Machine shop turnings	17.00
Short shovel turnings	20.00
Low phos. plates & structurals	45.50†

Cast Iron Grades

No. 1 cupola	*45.00*
Heavy breakable	27.00-28.00†
Foundry malleable	*39.00*
Unstripped motor blocks	*35.00*

Railroad Scrap

No. 1 R.R. heavy melt.	38.00†

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	25.00-26.00
No. 2 heavy melting	20.00-21.00
No. 1 bundles	25.00-26.00
No. 1 busheling	25.00-26.00
Machine shop turnings	7.00-8.00
Short shovel turnings	10.00-11.00
No. 1 cast	33.00
Mixed cupola cast	33.00
No. 1 machinery cast	34.00

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*31.00-32.00*
No. 2 heavy melting	*19.00-20.00*
No. 1 bundles	*32.00-33.00*
No. 2 bundles	*20.00-21.00*
No. 1 busheling	*31.00-32.00*
Machine shop turnings	*11.00-12.00*
Mixed borings, turnings	*12.00-13.00*
Short shovel turnings	*13.00-14.00*
Punching & plate	33.00-34.00

Cast Iron Grades

No. 1 cupola	*43.00-44.00*
Stove plate	*33.00-34.00*
Charging box cast	*34.00-35.00*
Heavy breakable	*34.00-35.00*
Unstripped motor blocks	*18.00-19.00*
Clean auto cast	*47.00-48.00*

SEATTLE

No. 1 heavy melting	30.00†
No. 2 heavy melting	28.00†
No. 1 bundles	22.00†
No. 2 bundles	20.00†
Machine shop turnings	9.00-10.00†
Mixed borings, turnings	9.00-10.00†
Electric furnace No. 1	38.00†

Cast Iron Grades

No. 1 cupola	31.00†
Heavy breakable cast	28.00†
Unstripped motor blocks	23.00†
Stove plate (f.o.b. plant)	21.00†

LOS ANGELES

No. 1 heavy melting	34.00
No. 2 heavy melting	32.00
No. 1 bundles	30.00
No. 2 bundles	17.00
Machine shop turnings	11.00
Shoveling turnings	13.00
Cast iron borings	13.00
Cut structurals and plate 1 ft and under	45.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	46.00

Railroad Scrap

No. 1 R.R. heavy melt.	38.00

SAN FRANCISCO

No. 1 heavy melting	32.00
No. 2 heavy melting	30.00
No. 1 bundles	30.00
No. 2 bundles	22.00
Machine shop turnings	15.00
Mixed borings, turnings	15.00
Cast iron borings	15.00
Heavy turnings	15.00
Short shovel turnings	15.00
Cut structurals, 3 ft	40.00

Cast Iron Grades

No. 1 cupola	44.00
Charging box cast	34.00
Stove plate	34.00
Heavy breakable cast	28.00
Unstripped motor blocks	31.00
Clean auto cast	40.00
Drop broken machinery	40.00
No. 1 wheels	34.00

HAMILTON, ONT.

No. 1 heavy melting	30.00
No. 2 heavy melting	26.00
No. 1 bundles	30.00
No. 2 bundles	23.00
Mixed steel scrap	25.00
Mixed borings, turnings	15.00
Busheling, new factory:	
Prepared	30.00
Unprepared	24.00
Short steel turnings	19.00

Cast Iron Grades‡

No. 1 machinery cast	39.00-41.00

*Brokers' buying prices.
†Nominal.
‡F.o.b. Hamilton, Ont.

THE NEW LOGEMANN MODEL 500-PF HIGH SPEED SCRAP PRESS

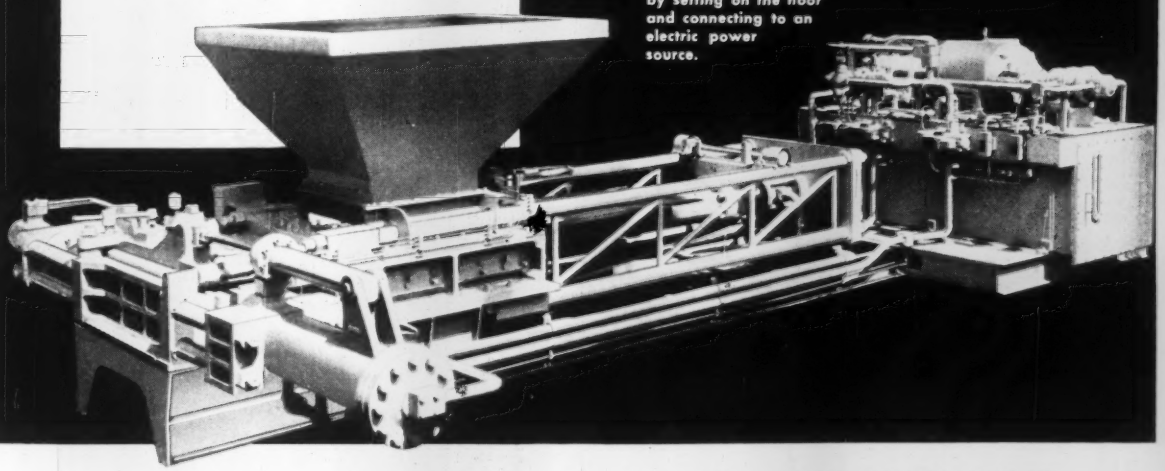
FAST LOADING! FAST BALING! FAST DISCHARGE!

Here is a two-compression, side-ejection press designed for high production — up to 240 bales per hour.

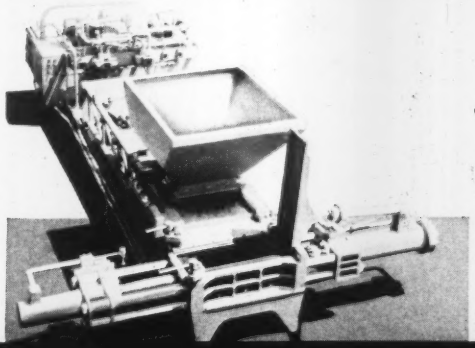
It is able to bale sheet clips, stamping skeletons, wire, cans, steel, copper, brass and aluminum scrap.

The LOGEMANN Model 500-PF press is a high-speed, high-density horizontal two compression unit. It is filled from a hopper supermounted above the compression box and discharges the compressed bale through a side opening. The operating cycle is automatic and continuous, or manual at the option of the operator.

No pit required for installation. Can be operated by setting on the floor and connecting to an electric power source.



BALE SIZE	6" x 12" x 8" (VARIABLE)
BALE WEIGHT	40 LBS. AVERAGE
PRODUCTION	UP TO 240 BALES PER HOUR



Designed for HIGH PRODUCTION

Here is a new high speed scrap press . . . geared for high production and extra baling profits for you. Famous "engineered" features, proved through actual operation, are built into this press to give you constant, uninterrupted service. It's a top-loading side-ejection press that can handle a variety of scrap. Write for the new Bulletin No. 220; it will give you complete information concerning design, pumping unit, valve assembly and accessory equipment. When making your inquiries please state the nature of your scrap and the tonnage desired.

LOGEMANN BROTHERS CO.

3126 W. BURLEIGH STREET • MILWAUKEE 45, WISCONSIN

How Workable Is Barter?

It may eventuallly help lead and zinc some, but rigid and complicated regulations rule out many early benefits. Prices raised for zinc mill products

Nonferrous Metal Prices, Pages 170 & 171

THE GOVERNMENT'S "revamped" barter program will be of little help to the domestic lead and zinc industry for at least the immediate weeks ahead — possibly never.

Metalmen disagree on ultimate benefits. Quips one: "Its possibilities appear to have been greatly exaggerated." Says another: "In the long run, political pressures from Latin American countries will make it work." Most producers believe the most barter can accomplish is to siphon some excess production from the world market.

• **Status** — The new program has yet to produce a single transaction involving lead and zinc. It is extremely complicated: Observers charge that even Agriculture Department officials aren't sure of all the program's ramifications.

Numerous rules and restrictions make it unwieldy. And Agriculture has made no bones that any offer will be carefully scrutinized. It does not want to "unduly disrupt world prices of agricultural commodities or replace cash sales for dollars."

When all the details are worked out, it may be possible to consummate a deal if one can be made with the "right" country. "The difficulty," says one producer, "is that most nations that produce lead and zinc are not big buyers of agricultural products."

• **Watchdog**—The progress of barter will be eyed carefully by Congress. "I don't think the program's scope will satisfy strong segments in the Senate," says a Washington observer. "These congressmen want a strong program so we can get something back for the agricultural commodities we ship abroad. It's true the old barter program has some abuses, but the administration not only killed the abuses, it killed the program."

• **Sales Slide**—Of more immediate concern to producers is that some of the bloom has faded from sales.

Source: Council of the Ingot Brass and Bronze Industry

Zinc shipments in November will come close to or perhaps better October's record breaking figure, and December should be about as good. But here's the hitch: This business was booked some time ago—new orders aren't coming in at anywhere near the pace of a few weeks ago.

Lead orders have dropped even more. November sales were down 20 to 30 per cent from October's, and December may see a similar fall.

• **Zinc Products Up**—The one bullish factor in the zinc market last week was the upward price move by producers of mill products. Sheets were hiked 2 cents a pound, strip and plates 1 cent. It marks the first upward price movement in mill products since Jan. 9, 1956. Producers say the bump reflects their higher labor and materials costs.

Custom Copper at 28.5¢

Custom smelted copper took its fourth price dip in nine days on Dec. 3 and now stands at 28.5 cents a pound, 0.5 cent under the price quoted by primary producers. The cuts came about because overseas demand dried up when London Metal Exchange prices weakened. Custom smelters diverted extra tonnage to the U. S. at a price attractive to domestic users. Price outlook for the rest of the year will depend on: 1. What the LME does (further weakness might cause another dip). 2. Demand from U. S. customers (if they aren't wooed by the 28.5 cent price, the quotation will fall again).

Market Memos

• Reynolds Metals Co. expects to bring in the first potline at its Massena, N. Y., reduction plant by next June. Full production is slated to be reached before the end of 1959.

• Shipments of magnesium castings hit 1402 tons in September, the highest figure since June, 1957. Shipments of wrought products fell slightly to 904 tons, and primary ingot production was 1791 tons.

NONFERROUS PRICE RECORD

	Price Dec. 3	Last Change	Previous Price	Nov. Avg	Oct. Avg	Dec., 1957 Avg
Aluminum	24.70	Aug. 1, 1958	24.00	24.700	24.700	26.000
Copper	28.50–29.00	Dec. 3, 1958	29.00	29.415	28.058	26.130
Lead	12.80	Oct. 14, 1958	12.30	12.800	12.473	13.300
Magnesium	35.25	Aug. 13, 1956	33.75	35.250	35.250	35.250
Nickel	74.00	Dec. 6, 1956	64.50	74.000	74.000	74.000
Tin	99.125	Dec. 3, 1958	99.25	99.034	96.500	92.395
Zinc	11.50	Nov. 7, 1958	11.00	11.386	10.865	10.000

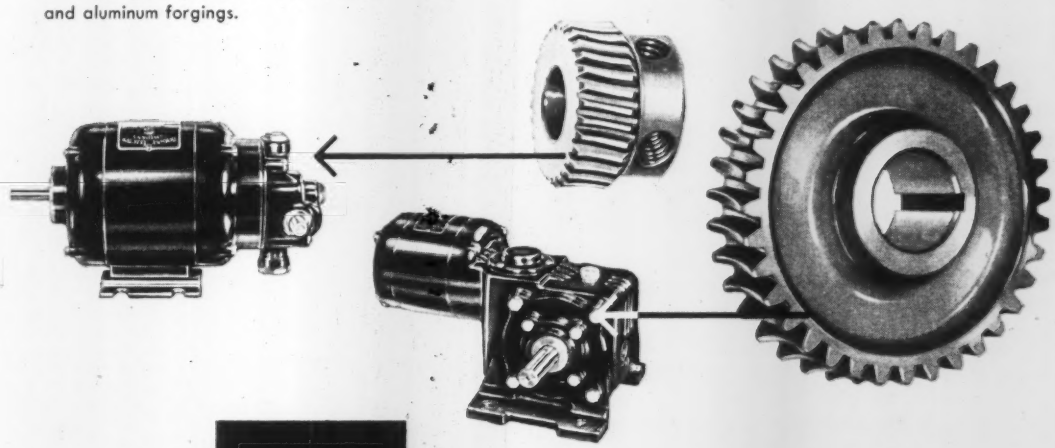
Quotations in cents per pound based on: COPPER, mean of primary and secondary, deld. Conn. Valley; LEAD, common grade, deld. St. Louis; ZINC, prime western, E. St. Louis; TIN, Straits, deld. New York; NICKEL, electrolytic cathodes, 99.9%, base size at refinery, unpacked; ALUMINUM, primary pig, 99.5+%, f.o.b. shipping point; MAGNESIUM, pig, 99.8%, Velasco, Tex.

MUELLER BRASS CO. forged gears improve dependability and performance of BODINE electric motors

For combined high shear strength and maximum wear life in their single and double reduction speed reducer motors, Bodine Electric Company of Chicago uses gears forged from Mueller Brass Co. 603 Alloy.

Bodine has specified Mueller Brass Co. forged gear blanks because of their consistently high quality . . . there is no porosity, foreign inclusions or defects typical of cast blanks. The hot working of the metal followed by heat treatment to the desired physical properties produces a refined grain structure to give uniform machining and wear in service. The forged blanks are consistent in size and held to close tolerances. Bodine has also found that the excellent machinability of the blanks in the hobbing operation increases overall hob life.

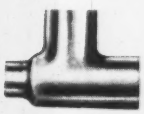
For forgings of high tensile strength, high density, minimum porosity, light weight, corrosion resistance, good machinability and low costs with little scrap loss, it pays to specify forgings from the Mueller Brass Co., the world's largest producer of brass, bronze and aluminum forgings.



only the man from Mueller Brass Co.

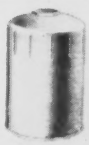
can offer unbiased advice on the "one best way" of producing your parts, because Mueller Brass Co. is the *only* fabricator in the country offering all these methods of production . . . assuring you the best product at the best price . . . made the one best way.

Write today for complete catalogs on any of these products.



FORMED COPPER TUBE

PLASTICS INJECTION MOLDING



COLD-PREST IMPACT EXTRUSIONS

SCREW MACHINE PRODUCTS

POWDER METAL PARTS

RED BRASS CASTINGS

Also producers of: Super Cutting Red Tip Brass Rod • Aluminum Extrusions Aluminum Sheet, Coil and Strip • Plastic Pipe and Fittings • Copper Tube and Solder Type Fittings •

MUELLER BRASS CO. PORT HURON 26, MICHIGAN

262

Nonferrous Metals

Cents per pound, carlots except as otherwise noted.

PRIMARY METALS AND ALLOYS

Aluminum: 99.5%, pigs, 24.70; ingots, 26.80, 30,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 28.60; No. 43, 28.40; No. 195, 29.40; No. 214, 30.20; No. 356, 28.60; 30 or 40 lb ingots.

Antimony: R.M.M. brand, 99.5%, 29.00; Lone Star brand, 29.50, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 24.50-25.50, New York, duty paid, 10,000 lb or more.

Beryllium: 97% lump or beads, $71.50 per lb, f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $74.75 per lb of contained Be, with balance as Al at market price, f.o.b. shipping point.

Beryllium Copper: 3.75-4.25% Be, $43 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. shipping point.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $1.45 per lb deld.

Cobalt: 97.99%, $2.00 per lb for 550-lb keg; $2.02 per lb for 100 lb case; $2.07 per lb under 100 lb.

Columbium: Powder, $55-85 per lb, nom.

Copper: Electrolytic, 29.00 deld.; custom smelters, 28.50; lake, 29.00 deld.; fire refined, 28.75 deld.

Germanium: First reduction, $179.17-197.31 per lb; intrinsic grade, $197.31-220 per lb, depending on quantity.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $70-80 nom. per troy oz.

Lead: Common, 12.80; chemical, 12.90; corroding, 12.90, St. Louis. New York basis, add 0.20.

Lithium: 98 + %, 50-100 lb, cups or ingots, $12; rod, $15; shot or wire, $16. 100-500 lb, cups or ingots, $10.50; rod, $14; shot or wire, $15, f.o.b. Minneapolis.

Magnesium: Pig, 35.25; ingot, 36.00 f.o.b. Velasco, Tex.; 12 in. sticks, 59.00 f.o.b. Madison, Ill.

Magnesium Alloys: AZ91A (diecasting), 40.75 deld.; AZ63A, AZ92A, 9Z91C (sand casting), 40.75, f.o.b. Velasco, Tex.

Mercury: Open market, spot, New York, $226-229 per 76-lb flask.

Molybdenum: Unalloyed, turned extrusions, 3.75-5.75 in. round, $9.60 per lb in lots of 2500 lb or more, f.o.b. Detroit.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 74.00; 10-lb pigs, unpacked, 78.25; "XX" nickel shot, 79.50; "F" nickel shot for adition to cast iron, 74.50; "F" nickel, 5 lb ingots in kegs for addition to cast iron, 75.50. Prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 1.01. Nickel oxide sinter at Buffalo, New York, or other established U. S. points of entry, contained nickel, 69.60.

Osmium: $70-100 per troy oz nom.

Palladium: $15-17 per troy oz.

Platinum: $52-55 per troy oz from refineries.

Radium: $16-21.50 per mg radium content, depending on quantity.

Rhodium: $118-125 per troy oz.

Ruthenium: $45-55 per troy oz.

Selenium: $7.00 per lb, commercial grade.

Silver: Open market, 90.125 per troy oz.

Sodium: 17.00 c.l.; 19.00-19.50 l.c.l.

Tantalum: Rod, $60 per lb; sheet, $55 per lb.

Tellurium: $1.65-1.85 per lb.

Thallium: $7.50 per lb.

Tin: Straits, N. Y., spot, 99.125; prompt, 99.00.

Titanium: Sponge, 99.3 + % grade A-1, ductile (0.3% Fe max.), $1.62-1.82; grade A-2 (0.5% Fe max.), $1.70 per lb.

Tungsten: Powder, 89.8%, carbon reduced, 1000-lb lots, $3.15 per lb nom., f.o.b. shipping point; less than 1000 lb, add 15.00; 99 + % hydrogen reduced, $3.30-3.80.

Zinc: Prime Western, 11.50; brass special, 11.75; intermediate, 12.00, East St. Louis, freight allowed over 0.50 per lb. New York basis, add 0.50. High grade, 12.50; special high grade, 12.75 deld. Diecasting alloy ingot No. 3, 14.00; No. 2, 14.25; No. 5, 14.50 deld.

Zirconium: Reactor grade sponge, 100 lb or less $7 per lb; 100-500 lb, $6.50 per lb; over 500 lb, $6 per lb.

(Note: Chromium, manganese, and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloys, 23.875-25.25; No. 12 foundry alloy (No. 2 grade), 21.75-22.00; 5% silicon alloy, 0.60 Cu max., 24.75-25.00; 13 alloy 0.60 Cu max., 24.75-25.00; 195 alloy, 25.25-26.00; 108 alloy, 22.25-22.50. Steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 23.25; grade 2, 22.00; grade 3, 21.00; grade 4, 19.00.

Brass Ingot: Red brass, No. 115, 28.00; tin bronze, No. 225, 37.50; No. 245, 32.25; high-leaded tin bronze, No. 305, 32.25; No. 1 yellow, No. 405, 23.00; manganese bronze, No. 421, 24.75.

Magnesium Alloy Ingot: AZ63A, 37.50; AZ91B, 37.50; AZ91C, 41.25; AZ92A, 37.50.

NONFERROUS PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb; nom. 1.9% Be alloy.) Strip, $1.885, f.o.b. Temple, Pa., or Reading, Pa.; rod, bar, wire, $1.865, f.o.b. Temple, Pa.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 20,000-lb lots, 34.35; l.c.l., 34.98. Weatherproof, 20,000-lb lots, 35.54; l.c.l., 36.29.

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more, $18.50 per cwt; pipe, full coils, $18.50 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill.) Sheets and strip $8.50-15.95; sheared mill plate, $6.60-9.50; wire, $6.50-10.50; forging billets, $3.80-4.35; hot-rolled and forged bars, $5.10-6.25.

ZINC

(Prices per lb, c.l., f.o.b. mill.) Sheets, 26.00; ribbon zinc in coils, 21.50; plates, 20.00.

ZIRCONIUM

Plate, $12.50-19.20; H.R. strip, $12.50-22.90; C.R. strip, $15.90-31.25; forged or H.R. bars, $11.00-17.40.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheets, C.R.	126	106	128
Strip, C.R.	124	108	138
Plate, H.R.	120	105	121
Rod, Shapes, H.R.	107	89	109
Seamless Tubes	157	129	200

ALUMINUM

Sheets: 1100, 3003, and 5005 mill finish (30,000 lb base; freight allowed).

Thickness Range, Inches	Flat Sheet	Coiled Sheet
0.250-0.136	42.80-47.30	.....
0.136-0.096	43.20-48.30	.....
0.126-0.103	.....	39.20-39.80
0.096-0.077	43.80-50.00	39.30-40.00
0.077-0.068	44.30-52.20	.....
0.077-0.061	.....	39.50-40.70
0.068-0.061	44.30-52.20	.....
0.061-0.048	44.90-54.40	40.10-41.80
0.048-0.038	45.40-57.10	40.60-43.20
0.038-0.030	45.70-62.00	41.00-45.70
0.030-0.024	46.20-53.70	41.30-45.70
0.024-0.019	46.90-56.80	42.40-44.10
0.019-0.017	47.70-54.10	43.00-44.70
0.017-0.015	48.60-55.00	43.80-45.50
0.015-0.014	49.60	44.80-46.50
0.014-0.012	50.80	45.50
0.012-0.011	51.80	46.70
0.011-0.0095	53.50	48.10
0.0095-0.0085	54.60	49.60
0.0085-0.0075	56.20	50.80
0.0075-0.007	57.70	52.30
0.007-0.006	59.30	53.70

ALUMINUM (continued)

Plates and Circles: Thickness 0.250-3 in. 24-60 in. width or diam., 72-240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	42.40	47.20
5050-F	43.50	48.30
3004-F	44.50	50.20
5052-F	45.10	50.90
6061-T6	45.60	51.70
2024-T4	49.30	56.10
7075-T6*	57.60	64.70

*24-48 in. width or diam., 72-180 in. lengths.

Screw Machine Stock: 30,000 lb base.

Diam. (in.) or across flats*	Round 2011-T3	Round 2017-T4	Hexagonal 2011-T3	Hexagonal 2017-T4
0.125	76.90	73.90	....	....
0.250	62.00	60.20	89.10	76.60
0.375	61.20	60.00	73.50	68.50
0.500	61.20	60.00	73.50	68.50
0.625	61.20	60.00	69.80	64.20
0.750	59.70	58.40	63.60	60.40
0.875	59.70	58.40	63.60	60.40
1.000	59.70	58.40	63.60	60.40
1.125	57.30	56.10	61.50	58.30
1.250	57.30	56.10	61.50	58.30
1.350	57.30	56.10	61.50	58.30
1.500	57.30	56.10	61.50	58.30
1.625	55.00	53.60	....	56.20
1.750	55.00	53.60	60.30	56.20
1.875	55.00	53.60	....	56.20
2.000	55.00	53.60	60.30	56.20
2.125	53.50	52.10	....	....
2.250	53.50	52.10	....	56.20
2.375	53.50	52.10	....	....
2.500	53.50	52.10	....	56.20
2.625	....	50.40	....	....
2.750	51.90	50.40	....	56.20
2.875	....	50.40	....	....
3.000	51.90	50.40	....	56.20
3.125	....	50.40	....	....
3.250	....	50.40	....	....
3.375	....	50.40	....	....

*Selected sizes.

Forging Stock: Round, Class 1, random lengths, diam. 0.375-8 in., "F" temper; 2014, 42.20-55.00; 6061, 41.60-55.00; 7075, 61.60-75.00; 7070, 66.60-80.00.

Pipe: ASA schedule 40, alloy 6063-T6 standard lengths, plain ends, 90,000 lb base, dollars per 100 ft. Nominal pipe sizes: ⅜ in., 18.85; 1 in., 29.75; 1¼ in., 40.30; 1½ in., 48.15; 2 in., 58.30; 4 in., 160.20; 6 in., 287.55; 8 in., 432.70.

Extruded Solid Shapes:

Factor	Alloy 6063-T5	Alloy 6062-T6
9-11	42.70-44.20	51.30-55.50
12-14	42.70-44.20	52.00-56.50
15-17	42.70-44.20	53.20-58.20
18-20	43.20-44.70	55.20-60.80

MAGNESIUM

Sheet and Plate: AZ31B standard grade, 0.32 in., 103.10; .081 in., 77.90; .125 in., 70.40; .188 in., 69.00; .250-2.0 in., 67.90. AZ31B spec. grades, .032 in., 171.30; .081 in., 108.70; .125 in., 98.10; .188 in., 95.70; .250-2.00 in., 93.30. Tread plate, 60-192 in. lengths, 24-72 in. widths; .125 in., 74.90; .188 in., 71.70-72.10; .25-.75 in., 70.60-71.60. Tooling plate, .25-.30 in., 73.00.

Extruded Solid Shapes:

Factor	Com. Grade (AZ31C)	Spec. Grade (AZ31B)
6-8	69.60-72.40	84.60-87.40
12-14	70.70-73.00	85.70-88.00
24-26	75.60-76.30	90.60-91.30
36-38	89.20-90.30	104.20-105.30

NONFERROUS SCRAP

DEALER'S BUYING PRICES

(Cents per pound, New York, in ton lots.)

Copper and Brass: No. 1 heavy copper and wire, 21.50-22.00; No. 2 heavy copper and wire, 19.50-20.00; light copper, 17.50-18.00; No. 1 composition red brass, 16.25-16.75; No. 1 com-

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES e (Based on copper at 29.00c)		
	Sheet, Strip, Plate	Rod	Wire	Seamless Tubes	Clean Heavy	Rod Ends	Clean Turnings
Copper	53.13b	50.36c	....	53.39	25.000	25.000	24.250
Yellow Brass	46.57	31.22d	47.11	49.98	17.000	16.750	15.250
Low Brass, 80%	49.23	49.17	48.87	52.54	21.250	21.000	20.500
Red Brass, 85%	50.17	50.11	50.71	53.48	22.125	21.875	21.375
Com. Bronze, 90%	51.65	51.59	52.19	54.71	22.875	22.625	22.125
Manganese Bronze	54.98	48.58	59.08	....	17.750	17.500	16.875
Muntz Metal	49.35	44.66	....	....	17.875	17.625	17.125
Naval Brass	51.24	45.05	57.80	54.65	17.625	17.375	16.875
Silicon Bronze	58.27	57.46	57.81	75.95	24.625	24.625	23.625
Nickel Silver, 10%	62.20	66.60	64.03	....	23.875	23.625	11.937
Phos. Bronze	72.59	73.09	72.59	74.27	25.875	25.625	24.625

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. Prices in cents per lb for less than 20,000 lb, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb.

position turnings, 15.25-15.50; new brass clippings, 14.25-14.75; light brass, 10.75-11.25; heavy yellow brass, 11.75-12.25; new brass rod ends, 12.00-12.50; auto radiators, unsweated, 13.00-13.50; cocks and faucets, 13.50-14.00; brass pipe, 13.50-14.00.

Lead: Heavy, 8.25-8.75; battery plates, 3.00-3.25; linotype and stereotype, 10.50-11.00; electrotype, 9.00-9.50; mixed babbitt, 9.50-10.00.

Monel: Clippings, 31.00-33.00; old sheets, 28.00-30.00; turnings, 22.00-24.00; rods, 31.00-33.00.

Nickel: Sheets and clips, 52.00-55.00; rolled anodes, 52.00-55.00; turnings, 37.00-40.00; rod ends, 52.00-55.00.

Zinc: Old zinc, 4.00-4.25; new diecast scrap, 3.75-4.00; old diecast scrap, 2.50-2.75.

Aluminum: Old castings and sheets, 9.75-10.25; clean borings and turnings, 6.50-7.00; segregated low copper clips, 13.00-13.50; segregated high copper clips, 12.00-12.50; mixed low copper clips, 12.75-13.25; mixed high copper clips, 11.25-11.75.

(Cents per pound, Chicago)

Aluminum: Old castings and sheets, 11.00-11.50; clean borings and turnings, 9.50-10.00; segregated low copper clips, 16.50-17.00; segregated high copper clips, 15.50-16.00; mixed low copper clips, 16.00-16.50; mixed high copper clips, 15.00-15.50.

(Cents per pound, Cleveland)

Aluminum: Old castings and sheets, 10.50-11.00; clean borings and turnings, 9.50-10.00; segregated low copper clips, 14.50-15.00; segregated high copper clips, 13.00-13.50; mixed low copper clips, 14.00-14.50; mixed high copper clips, 12.50-13.00.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 35.00; light scrap, 50.00; turnings and borings, 35.00.

Copper and Brass: No. 1 heavy copper and wire, 24.00; No. 2 heavy copper and wire, 22.50; light copper, 20.25; refinery brass (60% copper) per dry copper content, 22.00.

INGOTMAKERS' BUYING PRICES

Copper and Brass: No. 1 heavy copper and wire, 24.00; No. 2 heavy copper and wire, 22.50; light copper, 20.25; No. 1 composition borings, 18.50; No. 1 composition solids, 19.00; heavy yellow brass solids, 13.00; yellow brass turnings, 12.00; radiators, 15.25.

PLATING MATERIALS

(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes, $1.45.

Copper: Flat-rolled, 46.79; oval, 45.00; 5000-10,000 lb; electrodeposited, 38.50, 2000-5000 lb lots; cast, 41.00, 5000-10,000 lb quantities.

Nickel: Depolarized, less than 100 lb, 114.25; 100-499 lb, 112.00; 500-4999 lb, 107.50; 5000-29,999 lb, 105.25, 30,000 lb, 103.00. Carbonized, deduct 3 cents a lb.

Tin: Bar or slab, less than 200 lb, 117.50; 200-499 lb, 116.00; 500-999 lb, 115.50; 1000 lb or more, 115.00.

Zinc: Balls, 18.00; flat tops, 18.00; flats, 20.75; ovals, 20.00, ton lots.

CHEMICALS

Cadmium Oxide: $1.45 per lb in 100-lb drums.

Chromic Acid (flake): 100-2000 lb, 31.00; 2000-10,000 lb, 30.50; 10,000-20,000 lb, 30.00; 20,000 lb or more, 29.50.

Copper Cyanide: 100-200 lb, 65.90; 300-900 lb, 63.00; 1000-19,900 lb, 61.90.

Copper Sulphate: 100-1900 lb, 14.65; 2000-5900 lb, 12.65; 6000-11,900 lb, 12.40; 12,000-22,900 lb, 12.15; 23,000 lb or more, 11.65.

Nickel Chloride: 100 lb, 45.00; 200 lb, 43.00; 300 lb, 42.00; 400-4900 lb, 40.00; 5000-9900 lb, 38.00; 10,000 lb or more, 37.00.

Nickel Sulphate: 5000-22,999 lb, 29.00; 23,000-39,990 lb, 28.50; 40,000 lb or more, 28.00.

Sodium Cyanide (Cyanobrik): 200 lb, 20.80; 400-800 lb, 19.80; 1000-19,800 lb, 18.80; 20,000 lb or more, 17.80.

Sodium Stannate: Less than 100 lb, 78.00; 100-600 lb, 68.80; 700-1900 lb, 66.00; 2000-9900 lb, 64.10; 10,000 lb or more, 62.80.

Stannous Chloride (anhydrous): 25 lb, 153.20; 100 lb, 148.30; 400 lb, 145.90; 800-19,900 lb, 105.00; 20,000 lb or more, 98.90.

Stannous Sulphate: Less than 50 lb, 138.40; 50 lb, 106.40; 100-1900 lb, 106.40; 2000 lb or more, 104.40.

Zinc Cyanide: 100-200 lb, 59.00; 300-900 lb, 57.00.

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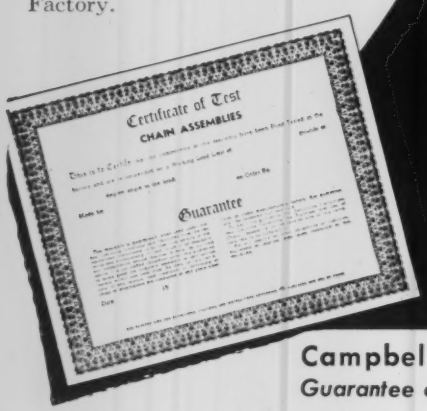

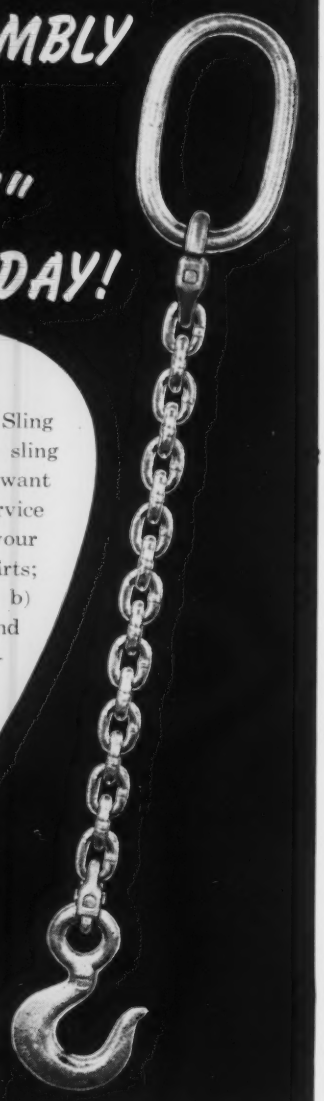

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(*Concluded from Page 165*)

was not in the market for scrap. A day later, however, it was learned the Japanese had negotiated for 150,000 tons of scrap to be shipped over the next four or five months. Not all of it will be purchased on the West Coast. Prices paid are said to be consistent with those asked of domestic mills.

Seattle—Japan covered its first quarter requirements, purchasing 19 full cargoes to be shipped from Gulf and Pacific Coast ports. The price paid is said to be $47 a gross ton, c.i.f. That compares with $44.60 paid the preceding quarter. The delivered price includes $8 freight, which is $1 higher than prevailed in recent months. Cargo sales are based on 40 per cent No. 1 steel, 40 per cent No. 2 steel, and 20 per cent No. 1 bundles.

Los Angeles—The market is stronger because of increasing exports from this area. Another firming influence is heavier foundry buying. Price on No. 1 cupola cast is expected to rise $1 to $2 a ton.

Scrap Trade Gain Forecast

Operations of scrap processors and brokers in the first half of 1959 will show measurable improvement over the 1958 level, Edwin C. Barringer, executive vice president, Institute of Scrap Iron & Steel Inc., Washington, told the Southeastern Chapter in Birmingham.

He said the industry could expect little improvement in demand the rest of this year, but forecast that volume in the first quarter of next year would improve over the 1958 average, and that the second quarter would show more gain.

European Steel Community Lifts Scrap Controls

For the first time since the creation of the six-nation European Steel Community in 1952, the group's council of ministers has freed the "little Europe" scrap iron market of controls. For some countries, it is the first time since World War II that scrap has been free of controls. The council rejected a plan for reorganizing the previous system of equalizing imported scrap prices through a special fund.

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8 REASONS
why you should use STERLING BARROWS

1 **ALWAYS READY** to use . . . no fuel or other "operating supplies" needed.

2 **NO "STARTING"** Problems . . . regardless of cold, heat, rain or dust.

3 **NO "HOUSING"** Problems . . . no protective warehousing needed, no covering, no "babying".

4 **NO MAINTENANCE** Problems . . . nothing to get out of order . . . rugged, long-lasting.

5 **EASIEST WHEELING** . . . with choice of pneumatic, semi-pneumatic or steel-tired wheels (plain, ball or roller bearings.) These are the easiest rolling wheelbarrows made!

6 **EASIEST** on the barrow man . . . engineered to balance 4/5th of load on the wheel; only 1/5th of load at handle grips.

7 **EASIEST, CLEANEST DUMPING** . . . Sterlings have steel trays engineered to unload completely, with least effort.

8 **COST LESS PER YEAR** . . . . Sterlings pay off in profits. Their unusually long service life protects your initial investment. And maintenance costs are nil.

IMMEDIATE SHIPMENT. Write for Catalog.

STERLING NATIONAL INDUSTRIES, Inc.
MILWAUKEE 14, WISCONSIN, U. S. A.

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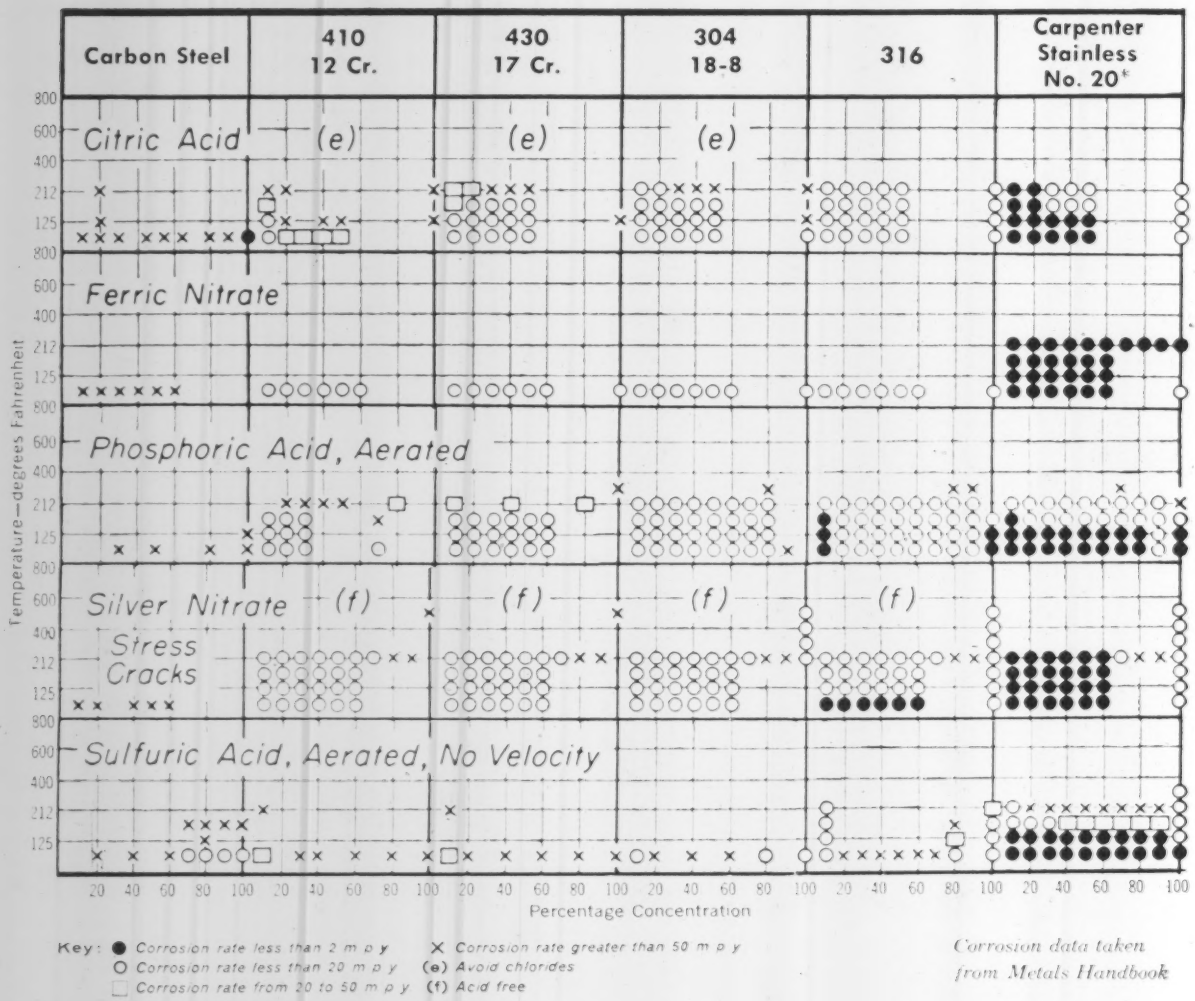
Sterling
WHEELBARROWS

A7-4513-1/4R



Corrosion data taken from Metals Handbook

The best single answer to most corrosion problems—*Carpenter* Stainless No. 20*

Carpenter Stainless No. 20 is your lowest cost way to control the most severe corrosive conditions. It's available in sheet, plate, bar, forging billets, forgings, tubing and pipe through your local distributor. And Carpenter Stainless No. 20 simplifies inventory problems. You don't need duplicate stocks of other products . . . one stock of Carpenter Stainless No. 20 will put an end to most corrosion problems. Order now from the "House of Corrosion Control". Complete technical data and job performance reports are yours for the asking. Write on your company letterhead to The Carpenter Steel Company, Alloy Tube Division, Union, N. J.

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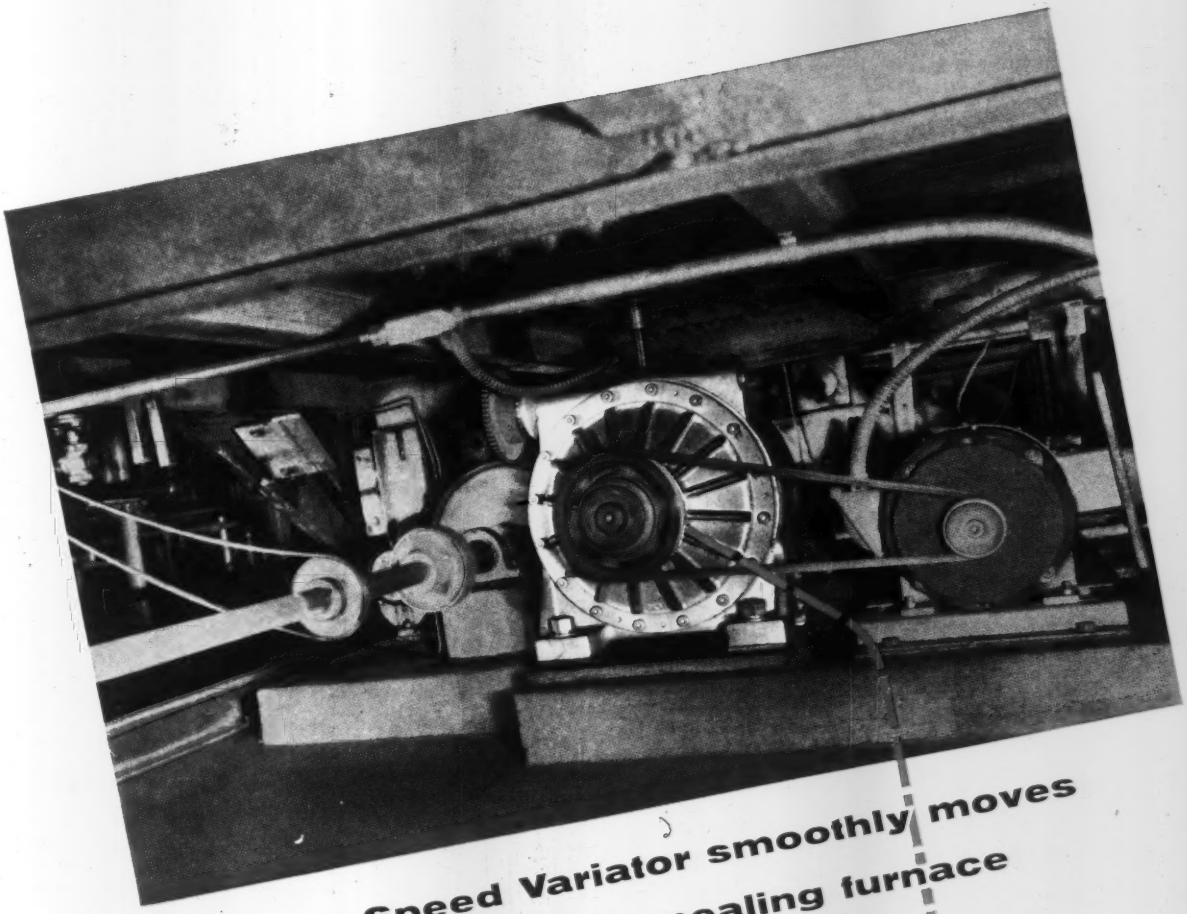

This Cleveland Speed Variator smoothly moves steel tubes through annealing furnace

A positive, electrically-controlled Cleveland Speed Variator maintains speed of steel tubes passing through this Surface Combustion continuous roller hearth annealing furnace. It drives the furnace's 176 rolls, each 6 feet long by 7 inches in diameter, without any speed fluctuation—that *could* cause uneven annealing, resulting in rejects, lowered production and profits.

Push-button control of the Variator's output speed is easily checked by dial indication showing tube movement.

A dual function is performed by the Variator. It also drives an outlet conveyor, whenever required, through a simple clutch arrangement.

Whenever speed variation is a "must" in your plant, investigate Cleveland Speed Variator. It will pay off in decreased maintenance, improved product quality and output. Send today for your free copy of Bulletin K-200 and get all the facts.

The Cleveland Worm & Gear Company, Speed Variator Division, 3270 East 80th Street, Cleveland 4, Ohio.

Sales representatives in all major industrial markets.
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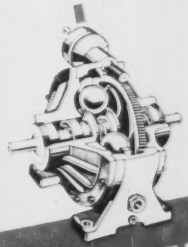

HOW IT WORKS

Power is transmitted from input shaft to output shaft through alloy steel driving balls which are in pressure contact with discs attached to the two shafts. Relative speeds of the shafts are adjusted by changing the positioning of the axles on which the balls rotate (see cutaway view, right).

CLEVELAND
SPEED VARIATOR

9,324 #2 Cans of Corn Per Minute...

No. 3 Electrolytic Tinning Line — Jones & Laughlin Aliquippa Works

This is the way the food industry might rate the speed of this Wean Electrolytic Tinning Line. And canners across the country recognize that such a modern, continuous, high speed tinplate line makes an important contribution to their business. For quality tinplate, produced at speeds up to 2000 fpm, is the low cost material from which over three billion "tin cans" are made annually.

Forty-seven Electrolytic Tinning Lines, engineered and constructed by Wean, account for more than 75% of the annual tinplate production.

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